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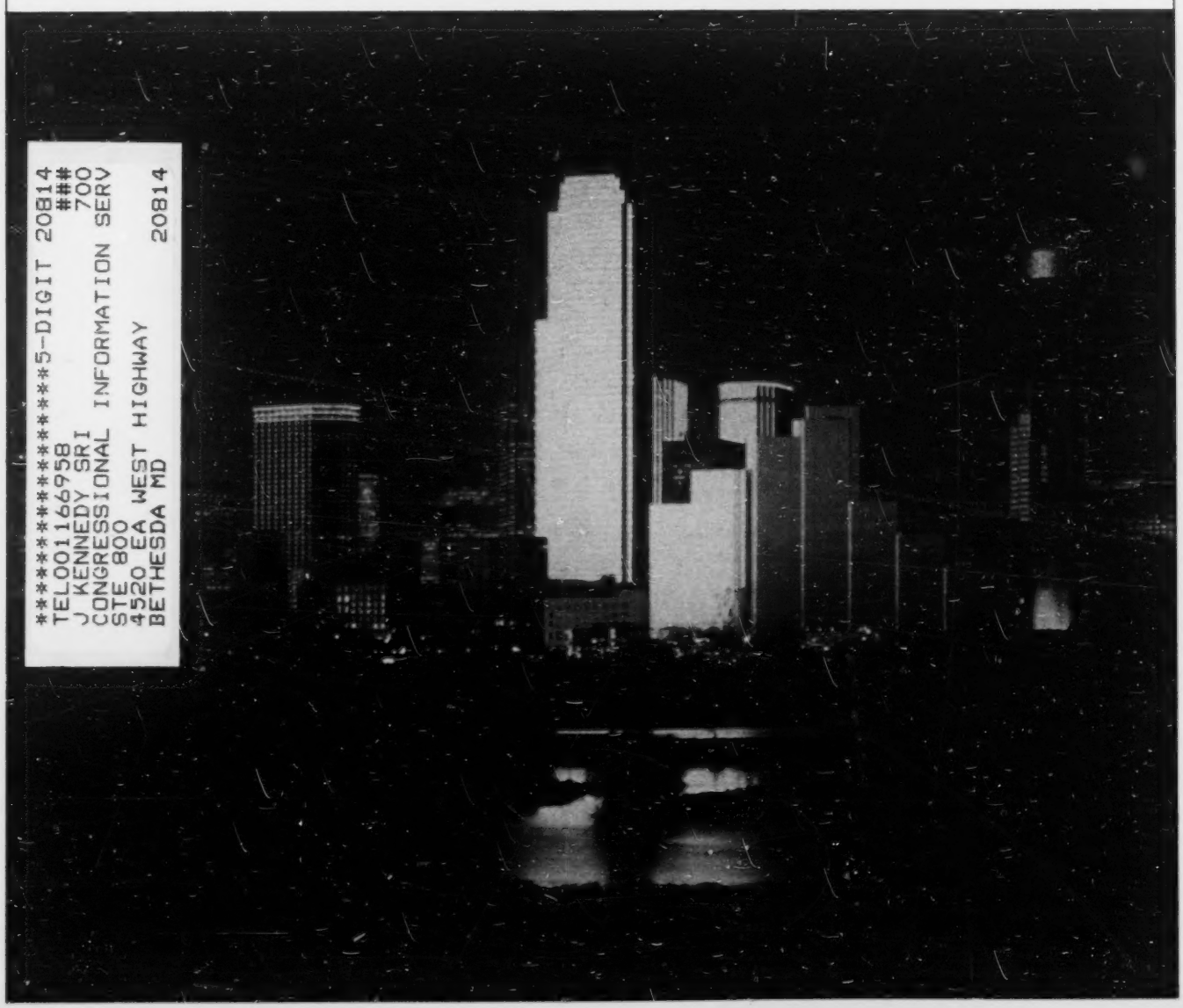

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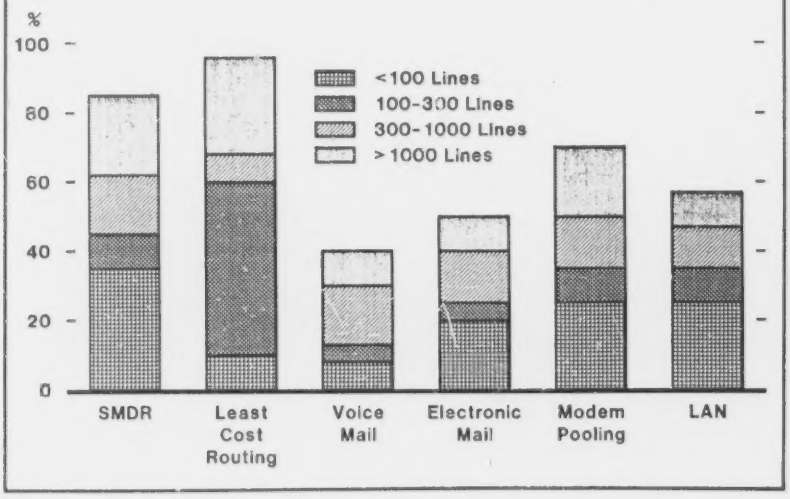
The economics of STS

Figure 1 User interest in multitenant features



SID HOOSEIN

MOST STUDIES on shared tenant services (STS) are from the perspective of an owner/developer and a STS provider. These studies include business cases, profitability analyses, market sizing and segmentation studies. However, not much has been said about the economic value of this service to end users in the business community.

Assessing STS' economic value is of interest not only to end users, but also to real estate developers, equipment manufacturers, network providers, regulators and STS providers. This is because the future of the service hinges upon the value it brings to the ultimate customer.

Analysis of the economic value becomes complex if all the costs incurred in owning and operating a telecommunications system are considered. Costs include the tangible costs of equipment, and also the intangible costs of risks involved and factors such as responsiveness, flexibility and reliability of service. Studies conducted by The Eastern Management Group, Parsippany, N.J., have shown that, based on the current service charges, STS can be an attractive proposition.

The market for STS is largely untapped and highly fragmented. Service providers include a large number of single building owner-operators and a few large multibuilding operators such as ShareTech and RealCom. (ShareTech is a joint venture between AT&T Information Systems and United Technologies, while RealCom is a subsidiary of Satellite Business Systems.)

STS includes basic and enhanced services. Basic services consist of tele-

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Sid Hoosein is Project Manager for The Eastern Management Group, Parsippany, N.J.

Table 1 Shared tenant service offering (755 stations)

Expense statement	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Equipment & service rate	0	(300,480)	(302,926)	(305,519)	(308,268)	(311,181)
Local service rate	0	(46,200)	(48,972)	(51,910)	(55,025)	(58,326)
Long distance rate	0	(254,575)	(269,850)	(266,041)	(303,203)	(321,395)
Long distance misuse savings	0	0	0	0	0	0
Moves & changes charge	0	(4,725)	(5,009)	(5,309)	(5,628)	(5,965)
Total costs before tax	0	(605,980)	(626,756)	(648,779)	(672,123)	(696,868)
Tax Savings	0	302,990	313,378	324,390	336,062	348,434
Total costs after tax	0	(302,990)	(313,378)	(324,390)	(336,062)	(348,434)

Discount rate	A.T. NPV 5 years
5.0%	(1,402,511)
7.5%	(1,308,496)
10.0%	(1,224,039)

phone equipment, local telephone service, long distance telephone service and maintenance and administration. Enhanced services include message center, voice mail, electronic mail, word processing, data processing including high speed data transmission, database services and local area networks (LANs). As the industry grows, many new services such as video teleconferencing also will be available.

To study the economic value provided by STS, determine the costs incurred in owning or leasing a standalone PBX and compare it with the shared services costs.

With STS, the basic costs involved are an equipment and service rate, local telephone service rate, long distance telephone service rate, and moves and changes. The equipment and service rate is quoted as the rate per station per month. This varies depending on the type of instrument and features.

This service rate includes station equipment, use of common equipment and software, installation, maintenance, electricity, system management, training and usually a direct inward dialing (DID) number per extension. A service agreement may be available to cap the rates for 3 to 10 years depending on the type of agreement. Table 1 shows the costs involved for 755 stations. Similar studies can be done for smaller configurations. Other cases examined were with 26 and 302 stations.

Computing the costs involved in an STS is relatively simple. Costs are usually specified in a service agreement. The chance of being hit with hidden charges is minimal. Since providers are anxious to develop this new business, it is possible to negotiate a favorable agreement especially if the tenant is an anchor tenant, occupying a large portion of a building.

A tenant can remove many risks associated with unplanned telecommunications expenditures through negotiation.

PBX vendors never clearly specify the costs of owning and operating a telecommunications system. Moreover, the PBX vendor is not responsible for the entire telecommunications system. Hence, it is unrealistic to expect a vendor to analyze the telecom requirements and make accurate cost estimates.

A good telecommunications staff must control costs. Divestiture has increased the responsibilities of a telecommunications staff and also the salary levels. One survey has indicated that more than 50% of the telecom managers earn above $40,000. Even with a competent staff, all the risks involved in owning and operating a telecommunications system cannot be removed.

The life cycle cost of owning a system should be considered against the cost of STS. The length of the life cycle is dependent on factors such as line size, nature of the business and technology. A 5- to 7-year horizon is usually appropriate. The measure commonly used is the net present value of the estimated cash outflows.

The net present value considers the time value of money. It can be regarded as the cash that has to be invested today at the prevailing interest rate to meet the future cash outflows for a project. Thus, to compare two projects requiring two different streams of cash outflows, the project with the lower net present value is preferable. Table 2 shows the estimated expenditures for owning a PBX with 755 stations. If a discount rate of 7.5% is used, the net present value of cash expenditures is 13% higher.

This analysis does not take into account the economic value of benefits from using shared services. Benefits such as responsiveness, flexibility and reliability that cannot be easily quantified further strengthen the case for STS.

Similar results were obtained for cases with 26 and 302 stations. Thus it can be shown that the savings accrue regardless of the size of the system. For smaller systems, one benefit that is not easily quantified is the availability of features that cannot be justified in a tenant's private telecommunications system.

Favorable costs for STS are derived from economies of scale in the major cost components. These components include local and long distance telco rates; common equipment cost; maintenance, installation and administration expenses; and miscellaneous costs including rent for PBX space, electricity and installation.

The current regulatory environment does not allow end users to derive maximum benefits from economies of scale from local telephone service. Some Bell regional holding companies are aggressively lobbying against STS and, as a result, service providers are keeping a low profile on savings from this cost component.

Savings can come from sources such as trunk sharing, special access lines to route long distance calls, and local loop bypass.

The prospects for savings from local

Continued on page 70

Table 2 Leased PBX operated by tenant (755 stations)

Expense statement	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Equipment, install, fitup-						
Amort. of leasehold improv.*	0	0	0	0	0	0
Amort. of PBX room fitup*	0	0	0	0	0	0
Lease of equipment (1)	0	(270,900)	(270,900)	(270,900)	(270,900)	(270,900)
Staffing-						
Administration	0	(35,000)	(37,100)	(39,325)	(41,686)	(44,187)
Receptionist	0	0	0	0	0	0
Other operating expenses-						
Maintenance	0	0	(36,240)	(38,414)	(40,719)	(43,162)
Rent for PBX space	0	(3,750)	(3,975)	(4,214)	(4,466)	(4,734)
Insurance	0	(5,375)	(5,698)	(6,039)	(6,402)	(6,786)
Electricity	0	(4,530)	(4,802)	(5,090)	(5,395)	(5,719)
Moves and changes charge	0	(6,615)	(7,012)	(7,433)	(7,879)	(8,351)
Local service-(COs, DIDs, # Grps, etc. . .)						
Trunk installation	(11,896)	0	0	0	0	0
Service charges	0	(48,672)	(51,592)	(54,688)	(57,969)	(61,447)
Long distance costs-						
Installation	0	0	0	0	0	0
Service and usage charges	0	(275,469)	(291,997)	(309,517)	(328,088)	(347,773)
Network optimization	0	(5,000)	(5,300)	(5,618)	(5,955)	(6,312)
Call detail record costs-						
Installation	0	0	0	0	0	0
Internal support	0	(5,000)	(5,300)	(5,618)	(5,955)	(6,312)
Long distance misuse savings	0	0	0	0	0	0
Total costs before tax	**(11,896)**	**(660,311)**	**(719,916)**	**(746,857)**	**(775,414)**	**(805,685)**
Tax savings	5,948	330,156	359,958	373,428	387,707	402,842
Plus ITC benefit	0	0	0	0	0	0
Total costs after tax	**(5,948)**	**(324,207)**	**(359,958)**	**(373,428)**	**(387,707)**	**(402,842)**

	Discount rate	A.T. NPV 5 Years
* Tenant chose to include these items in the equipment lease	5.0%	(1,604,344)
** Does not include consultant fees for analysis of needs and equipment selection	7.5%	(1,496,481)
	10.0%	(1,399,621)

telephone service are bright. The most recent regulatory developments in Illinois Bell territories indicate that intra-LATA (local access and transport area) competition is inevitable. When this happens, STS users will benefit first from the economies that can be derived. This is because of the aggregation of demand for this service in a building.

Long distance telephone service is a source for savings, especially for the small- and medium-sized firms. Long distance use is monitored closely by STS providers. Station message detail recording (SMDR) is a standard feature with shared services. Routine network optimization studies also are used to ensure that the type of long distance service selected is optimal in terms of the vendor and the type of lines, such as WATS and FX lines. This service is transparent to the STS customer as he shares a large virtual trunking network.

To illustrate the economies involved, consider a 3-minute call from Washington to New York. A direct distance dialing (DDD) call costs $1.28. A call on a WATS line (Band 2) costs 72¢, a 43% savings. On an FX line, the same call costs only 36¢, a savings of 71%. Small- and medium-sized firms cannot take maximum advantage of these savings because they are unequipped to conduct traffic engineering studies and optimize the service type. Moreover, the volume of traffic on an individual basis does not justify such studies or the installation of SMDR to track long distance calls. As a result, even if they have WATS and FX lines, there usually is an overflow on DDD lines.

The economies of scale derived from common equipment and software enable the availability of advanced PBX features to all users. Figure 1 shows user interest by line size for commonly available features such as SMDR, least cost routing, voice mail, electronic mail, modem pooling and LANs. STS provides these users with many enhanced services in a cost effective manner.

The message center is an enhanced service that becomes cost-effective for tenants subscribing to STS. The message center eliminates the need for a secretary to answer the telephone and frees the secretarial staff for more productive administrative work.

Secretarial cost per call is estimated at $1.09. This includes salary, equipment, furniture and rent for the desk space. By using a message center, this cost can be brought down to 18¢ per call. Using a message center also could eliminate the need for multibutton sets

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and thus reduce equipment costs.

Another economic value derived from using common equipment is the flexibility that it provides to the tenants. By using STS, a small high growth company can invest its capital in the business rather than in the telecommunications equipment. As the company grows it can add more stations rather than upgrade the PBX.

Perhaps the most economic value derived from STS is the service aspect. The lost business from an unanswered client or customer phone call cannot be easily measured. Most service providers have on-site personnel for maintenance, installation and administration. The responsiveness and reliability of service is usually very good. The incentive for providing this type of service is often built into the agreement as imposition of penalties for downtime.

Another aspect of the service is the single vendor concept. STS eliminates the need to deal with multiple vendors. In the post-divestiture environment, the telecommunications network has become extremely complex. If a problem occurs, it is difficult to determine whether it is with the premise equipment or with the transmission facilities. This leads to expensive and unnecessary service calls from the wrong vendors. The end user has no control. While the different vendors resolve where the problem is and this takes time, he is completely out-of-service. STS eliminate such problems, saving time and money.

Finally, cost savings accrue as a result of economies of scale derived from miscellaneous costs such as rent for the PBX room, spares, electricity and installation.

The future of STS is promising. As providers capture the business in more buildings in large metropolitan areas, networking capabilities will create large private networks providing many enhanced services such as video teleconferencing and software defined networks. Both large users and the smaller tenants, who could not otherwise justify the cost of its use, will benefit from these services.

The deployment of new technologies will enable providers to deliver enhanced services to all users. The economies derived from local and long distance telephone services, common equipment and software, on-site maintenance staff and other factors make shared services a viable and cost effective alternative to owning and operating a telecommunications system. □

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Bringing cellular service to Malaysia

GRAHAM LANGLEY

THE GROWTH of Malaysia's telephone network has been given a tremendous boost by a government decision made about 3 years ago to award several contracts for development work.

Contractors are now responsible for supplying and installing all needed new exchanges in the form of locally assembled Ericsson's AXE and Nippon Electric Co.'s NEAC 61 systems. A new national digital microwave system from Standard Elektrik Lorenz A6 of West Germany and a large number of pulse code modulation systems, locally assembled by Marconi of Italy, are also used. For local cable networks the country has been divided into four geographic zones, each zone allocated to a private local company. The local companies are responsible for forecasting future demands for telecommunications services, recommending sites needed for new exchanges and the boundaries of their service areas, and planning and installing all necessary external plant, including manholes, duct systems and distribution cables, to satisfy projected future demands.

Each of these four contractors has until 1988 to provide over 400,000 extra effective cable pairs between exchanges and subscribers' distribution points, a total of over 1.7 million extra subscriber lines. The scale of all this development and its impact on the network is illustrated by recent telephone statistics shown in Table 1.

Although Malaysia's industrialization is proceeding rapidly, especially in the Kelang Valley area between Kuala Lumpur, the national capital, and the peninsula's west coast, the majority of the nation's land mass is still tropical forest land. The percentage of the population living in urban areas has indeed risen from 27% in 1970 to 34% in 1980, but a great many of Malaysia's villages (kampongs) are in comparatively isolated areas many miles from the nearest town.

As part of its drive to expand the telecommunications network—the national aim is a phone in every home within 20 years—the Malaysian Telecommunications Dept. decided to kill two birds with one stone and replace its limited, old-style very high frequency car radio service with a modern cellular radio system. This new cellular system will also provide basic telephone communications to many isolated areas where service using conventional distribution plant, either cable or radio, is beyond the government's present budget.

The Malaysian cellular system is based on the Nordic Mobile System, with radio base stations and exchanges provided by Ericsson. The use of 400 megahertz (MHz) for the first phase of the system has provided almost nationwide coverage to this 329,749 square

Government of Malaysia photo

Bringing telecommunications services to rural and remote areas presents many problems for service providers. For countries such as Malaysia, whose national mosque in Kuala Lumpur is shown above, the cost-effective answer is cellular.

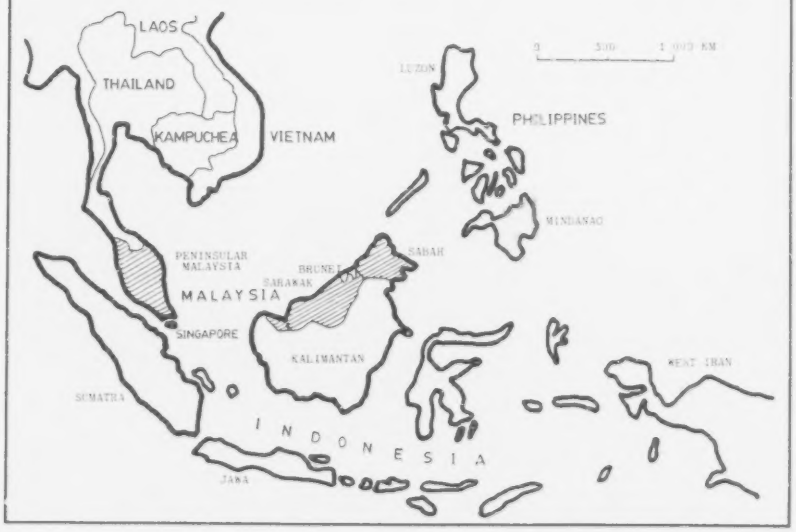
Graham Langley is a telecommunications consultant with many years experience in Singapore and Malaysia. He is also author of *Telephony's Dictionary*.

Table 1 Development of Malaysian telephone network

Date	Total number of working telephone lines Malaysia	Growth rate % per year	Telephone lines per 100 people	Total number of waiters for telephone service
31 Dec 82	585 387	20%	4.3	189 808
31 Dec 83	700 097	20%	5.0	199 831
31 Dec 84	849 129	21%	5.9	190 542

(Total population is growing at some 2.3% per year, 1980 census population was 13.14 million)

Map of Southeast Asia



kilometer (km) country by only 86 radio base stations, most of which have a coverage area of about 30 km. Up to 32 channels are at present available from each base station. The highest station in the whole system is on Mt. Kinabalu in Sabah, 2231 meters (m) above sea level. There also are stations in Malaysia on Kedah Peak at 1217 m and Guong Ulu Kali at 1772 m. These high altitude stations serve larger areas than those at lower sites.

For administrative purposes the country is divided into five service areas, each served by one Ericsson AXE mobile exchange. The mobile exchanges are at Subang Jaya near Kuala Lumpur, Seberang Jaya near Penang, Pelanggi in Johore State, Kota Kinabalu in Sabah and Kucing in Sarawak. Each of these areas acts as the home area for a mobile subscriber, and all calls addressed to such subscribers are directed first to the home exchange and then to the mobile.

Mobile stations are not cheap in Malaysia. Customers must obtain their own radio terminal equipment from one of the approved suppliers. Typical costs are $7000 or over per set. An initial deposit of $300, an access fee of $720 and a radio license fee of $50 per year must be paid to Telecoms. Call fees are also charged. These vary with distance and time but are higher than fees charged for ordinary long distance calls even for calls between mobiles in the same local area: $0.90 for a 3 minute mobile call within the same area compared with only $0.10 for a 3 minute local call from a cable-fed telephone. Although Malaysia is a developing country, it has a lot of very wealthy people willing to pay these comparatively high charges. There were 600 mobile subscribers within a month of the opening of the new system.

A special pay phone interface has been developed, enabling standard pay phones to be used as static stations on this cellular radio system. In remote areas the pay phones will use a solar panel power supply.

The first order for 500 of these special rural pay phone units has been placed. Delivery is expected by the end of 1985. Call fees from these pay phones are to be the same as those from ordinary cable-fed pay phones, so there will be a substantial measure of cross-subsidization: The well-to-do users of car phones can be happy in the knowledge that they are, in effect, making affordable telephone service possible to a great many remote rural areas. □

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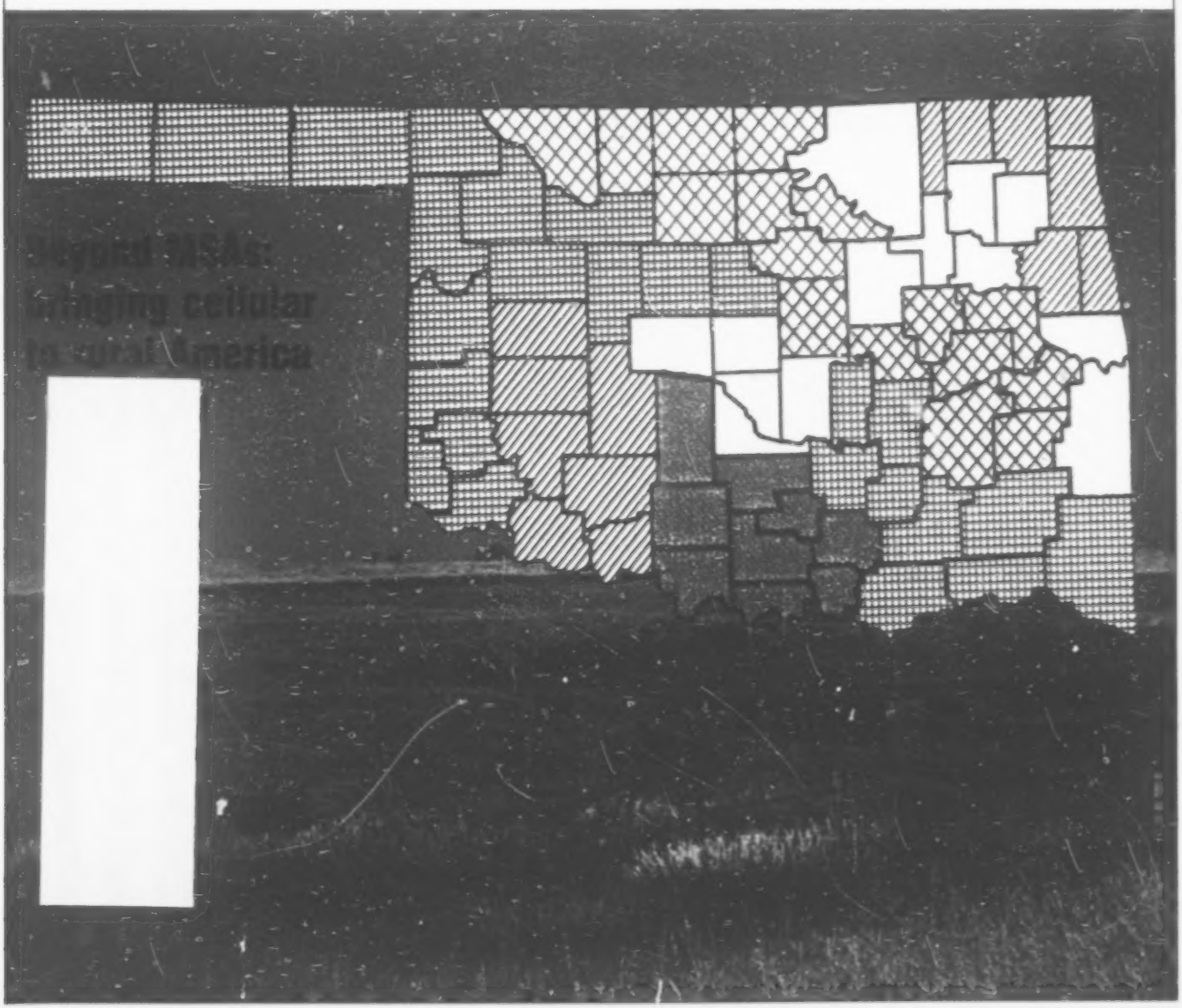

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Beyond MSAs: Bringing cellular service to rural America

EDWARD W. TOWERS

SUDDENLY RURAL areas are becoming "hot" commodities in the cellular mobile phone business. Areas outside the metropolitan statistical areas (MSAs) contain only 24% of the U.S. population but represent 84% of U.S. geography.

MSAs are defined according to a set of detailed standards prepared by the Federal Committee on MSAs and are based on entire counties, except in New England. There are 305 MSAs that qualify by being a city of at least 50,000 people or an urban area of at least 50,000 with a total metropolitan population of at least 100,000 (Table 1). Non-MSAs are areas that are not included in any of the 305 MSAs.

The Federal Communications Commission (FCC) is granting licenses for cellular service in the large cities first. To date, only the top 90 markets have been settled; applications have been received and accepted by the FCC for MSAs 91-120. It has taken the FCC over a year to accept applications for this last tier of 30 markets.

Why are we discussing non-MSAs when there are still 215 MSAs yet to be filed? It is true that, in general, non-MSA markets are not as valuable as MSAs. In addition, current FCC rules would settle the non-MSA markets some years in the future.

One might suppose that these rural areas should be a low priority. But the cellular business is a vibrant and dynamic industry in which methods and priorities change daily. There are very valid reasons why non-MSAs are now being discussed.

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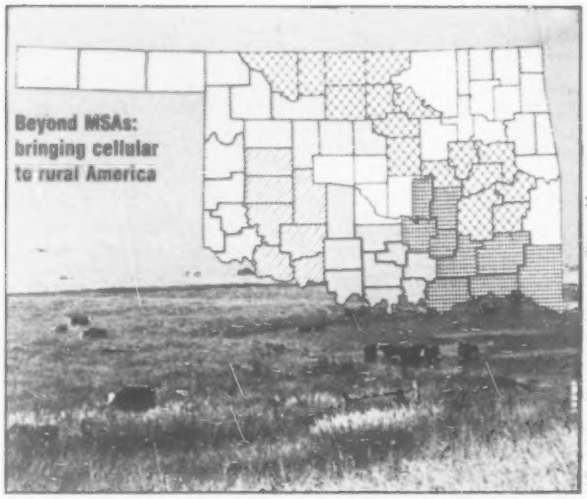
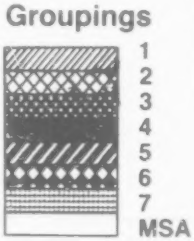
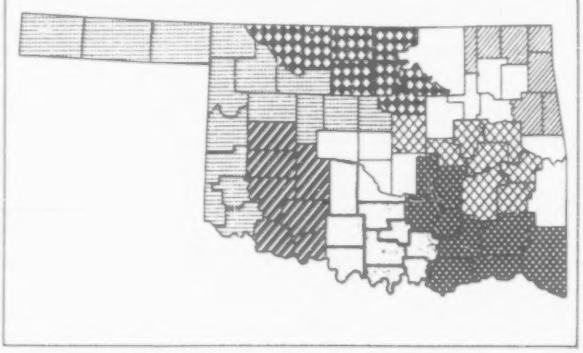
The controversy still stands on how to bring cellular service to sparsely populated areas.



U.S. cellular chart, cover design by Sharon Marjack

Figure 1
Proposed Non-MSA Cellular Serving Area





The FCC ruled that cellular system operators may provide fixed (not mobile or portable) cellular service on an incidental basis. This was the result of a concept, articulated by Bill West of Westcom, of providing fixed cellular service in rural America now—not waiting for all MSAs to be built first. Metro Mobile CTS has also petitioned the FCC, asking that 14 mile wide non-MSA corridors be allowed between developed MSAs within 75 miles of each

FCC update: revising the non-MSA rules

THE FEDERAL Communications Commission (FCC) is quickly moving to revise its rules on non-MSA markets. Areas outside the metropolitan statistical areas (MSAs) and New England County metropolitan statistical areas (NECMAs) have attracted intense interest lately from rural telcos.

In December, the commission adopted a proposal to divide each state into non-MSA markets along county lines (TELEPHONY, Dec. 23, 1985, p. 16). The plan, presented by United TeleSpectrum, would create an average of eight markets per state with about 150,000 people in each. The commission chose as an alternative a plan offered by Telephone and Data Systems, Inc. (TDS). The TDS proposal would divide states along county lines to produce an average of 6.7 markets per state with an average population of 200,000. The FCC is soliciting comments, due by Feb. 1, on both plans.

The FCC also recently rejected a proposal made by Metro Mobile CTS that would have allowed cellular operators in MSA markets to connect their systems via corridors through non-MSA markets. The commission opined that this plan might delay the licensing of the remaining MSA markets.

other. This would allow operators of cellular systems in the large cities to "creep" out along interstates into rural areas. Both proposals focus on how cellular systems will be built in rural America.

Another reason for the interest in rural areas is that the current cellular operators want to provide cellular to collar counties. Collar counties are non-MSA counties that are contiguous to the counties constituting the MSA. In fact, some operators are already providing cellular service outside of the MSA into collar counties. This is annoying to the telcos with presence that are considering providing cellular in these areas in the future.

Actually, rural areas are where telcos can realize the greatest savings by providing cellular. This is because of the high cost to wire POTS (plain old telephone service) in locations with low population density.

Rural America doesn't want to wait until all 305 MSAs are settled before it can be introduced to this exciting new technology. Farmers know about the growth in the cellular industry: Like their city cousins they read newspapers which forecast 2.6 million cellular subscribers by 1990. And suburbanites, for their part, don't want to be denied cellular services just because they live 10 miles outside the city.

Finally, the development of non-MSA cellular systems will add to the value of MSAs. This is because of the prevalence of roamer (or, as we call them, "homer") arrangements between operators in different markets. Roaming allows a cellular subscriber to use a unit when away from the home system. With 80 cellular systems now built, roaming becomes a significant source of incremental revenue to cellular operators.

Back in June 1985, as part of a task force headed by the United States Telephone Assn., two questions were asked. Should the present non-MSA rules be changed by the FCC? And if so, what criteria should be used to define non-MSA areas?

The current FCC rules for non-MSA filings call for separate wireline and non-wireline filings to be made on some unspecified date in 1986 or later. Each telco with presence will be allowed a single filing, not to exceed 2000 square miles, and must list the major towns in the filing area. Non-MSAs that attract multiple filings will be settled by lottery or by voluntary settlement between the interested parties. Finally, all non-MSA geography not filed for will be made available for a second round of filing at a later date.

Unclear boundaries

There are many problems created by these rules. Filers can design their own non-MSA filing area. Consequently, there is no standard for defining these areas. MSAs, on the other hand, have easily understood boundaries. The lack of a common definition for non-MSA coverage makes it hard for operators to plan systems in these markets. It will be almost impossible to settle a non-MSA market if multiple, overlapping and different-shaped coverage areas are allowed. For example, an out-of-state telco 200 miles away could fulfill the 2000-square mile requirement by filing for a 200-mile-long, 10-mile-wide area. Yet such a filing might cover an exchange that the local telco plans to serve.

Many of the non-MSA areas will probably not receive cellular because

the filers will design their filings to cover only those territories they perceive to be of high value. The filers naturally will ignore unprofitable areas. Indeed, some potential 2000 square mile non-MSA areas will be more valuable than some of the smaller MSAs. Alton/Granite City, Ill., which is MSA 305, has only 20,538 residents, according to the 1980 census. Many 50 by 40 square mile areas outside of cities have stronger market demographics than the Alton/Granite City area.

Selling to people, not acreage

The biggest problem with the present rule is that common sense tells us that telcos sell to people, not square mileage. Population density is what matters to the telco. The FCC's existing 2000 square mile maximum is not, in general, large enough to be economically feasible. This is particularly true for stand-alone cellular installations. The average density of non-MSAs is 18 people per square mile. A maximum filing would contain only 36,000 people on average. If an operator does not have enough of a potential market to draw on for sales, it cannot expect to make a profit and it will not build. It is critical that non-MSA areas be of sufficient size to be economically viable.

TDS/U.S. Cellular concludes that the existing non-MSA rules must be changed. Now, what should those new rules be?

To answer this question, TDS evaluated mapping alternatives. There are many different ways to establish geographic boundaries. Zip codes are common but they are too small to be useful and change too often. Telephone exchanges are frequently used in telephony but again are too small to serve the purpose of the cellular industry. In addition, nobody outside of the telephone industry cares about telephone exchanges, nor can much marketing information be gathered that is exchange-specific.

TDS looked at eight alternatives. The first alternative was to group counties along corridors—highways—until a target total of about 50,000 people was reached. The second, third and fourth alternatives were likewise based on country lines going along corridors until approximately 100,000, 150,000 and 200,000 people, respectively, were gathered. TDS sampled seven states for the first and second alternatives and 11 states for the third and fourth alternatives. Many iterations had to be made before each state balanced out and made sense. Alternative number 5 was based on local access and transport (LATA) boundaries, while number 6 was based on area codes. Option number 7 involved taking 10 purely arbitrary slices through a state to determine the average, or arithmetic, mean. Option 8 was the base case of the current 2000 square mile rule.

The results for each alternative are shown in Table 2. The first alternative resulted in an average of 24 non-MSA groupings per state, each with an average of 1631 miles. This is less than the present FCC rule will allow. In the second, third and fourth alternatives, the number of groupings per state goes down and the average number of square

Continued on page 70

Table 1 Market Population by Tier*

Market Tier	1980 Population	Average Population
1-30	91,971.9	3,065.7
31-60	23,580.4	786.0
51-90	15,859.0	528.6
Total	**131,411.3 (58%)**	
91-120	10,151.9	338.4
121-150	7,938.8	264.6
151-180	6,238.6	207.9
181-210	4,512.9	150.4
211-240	4,069.0	135.6
241-270	3,464.7	115.5
271-305	3,002.7	100.1

Population Totals

MSAs	**170,789.9**
United States	**226,549.0**
Non-MSAs	**55.759.1**

*Excludes Puerto Rico

How big is big enough?

HOW MANY subscribers does a cellular system need to be economically viable? United States Cellular, a TDS unit, examined the question in the following way.

Assuming a cellular system costs $300,000 per site, each site will require 100 subscribers paying an average monthly bill of $100. Since a single cellular site covers, approximately, a 25 mile diameter, its radius (r) is 12.5 miles; the number of square miles covered can be computed by $\Pi x r^2$, or 3.1416 x 12.5^2. Thus, each cell can serve approximately 490.8 square miles. For example, a 10-cell system will cost about $3 million, serve about 4908 square miles and require a minimum of 1000 subscribers.

United States Cellular argues that, as a rule of thumb, cellular operators can hope to gain 1% of the population as subscribers within 5 years. Therefore, to reach a target of 1000 subscribers, a base population of 100,000 is needed. Of course, competition with a non-wireline operator changes the numbers. If the non-wireline takes 50% of the telco's cellular business, a base population of 200,000 is needed to support the telco's 10-cell system.

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miles goes up proportionately. We discarded LATA and area codes as a means of dividing the non-MSAs because they are too large, frequently taking up a whole state.

The real question is: How many people are needed to support a cellular system? It is a balance between total population, total square miles, and pockets or corridors that have more population than average. If it takes 200,000 people to support a system, but an operator must go to 50,000 square miles to get that population, he will have defeated his purpose. It would be too expensive to cover all that land.

After we studied these results, we still were not satisfied with any of the eight alternatives. It occurred to us that the smaller-size MSAs really have the same problem. Many of the smaller MSAs probably will not support a stand alone cellular system. The last tier of markets has an average population of only 100,000.

Combine non-MSAs and MSAs

We, therefore, considered combining the non-MSA areas with the smaller MSAs. TDS's recommendation, now before the FCC, is to group counties along corridors until the target of 200,000 people is reached and to include those counties that make up MSAs 211-305. MSA 211 had a 1980 population of only 148,442. Small cities thus become the core of non-MSA areas. We used Rand McNally Basic Trading Areas as a guide in developing boundaries. This allowed each grouping to keep its common business or trading sphere of influence. All 50 states have now been mapped with this new alternative. The results are 336 total areas nationally for an average of 6.7 groupings per state. Excluding Alaska, the average is 7467 square miles per group (Table 3).

Additionally, TDS recommends that the percentage of the cellular geographic serving area that the operator has to cover be a minimum of 40% of population living in the area by the third year and 60% by the seventh year after the covering license is granted. This will require cellular operators to serve a substantial portion of the areas.

In the filing we have included computer generated and color-coded state maps depicting the proposed new cellular service areas. The maps are individually coded per page in color to designate each service area within a state. For instance, consider the case of Oklahoma (Figure 1). There are seven non-MSA groupings in Oklahoma. The areas that are not colored are counties of MSAs 1-210. The small MSAs of Enid (MSA 302) and Lawton (MSA 260) are part of groupings 6 and 5, respectively. The filing also includes a binder of supporting information with details of each county and grouping, tabbed by state.

One concern that has been mentioned relative to the TDS proposal is that it affects agreements that might already be in place in the MSA markets beyond 211. Any proposal establishing common definition of cellular service areas for these markets will impact such agreements and may be modified. The key is that cellular areas need to be technically and financially viable or any agreement is of little value.

The major advantage of our proposal is that more of rural America will be served with cellular technology. The serving areas have a sufficient population base to support at least one cellular system, are built around corridors and many have a small MSA as their core. The beneficiaries of the proposal will be rural America and the people traveling through these areas.

Our proposal provides a great improvement over the unworkable present definition and a way to define economically viable cellular service areas. It also assures the maximum possible service to rural areas with the natural participation of small and rural telephone companies. It represents a solution to small MSAs as well as the creation of rural cellular opportunities. □

Table 2 Results of Initial Eight Alternatives

Alternative	Total non-MSA areas	Average non-MSA areas per state	Average square miles/area	Actual average population/area
1. 50,000 pop. (7 states)*	171	24	1631	60,297
2. 100,000 pop. (7 states)*	98	14	2890	106,668
3. 150,000 pop. (11 states)*	93	8	3670	148,866
4. 200,000 pop. (11 states)*	69	6	4842	197,136
5. LATA (2 states)*	3	1.5	16,409	442,508
6. NPA (2 states)	3	1.5	16,409	442,508
7. 10 Arbitrary slices (3 states)	3	10	4111	109,357
8. 2000 sq. mi. (7 states)*	41	6	2000	157,964

* Vermont and New Hampshire are combined as one state.

Table 3 TDS's Proposal for Redefining Non-MSA Areas

Proposal: Combine non-MSA counties and MSAs 211-305 going along corridors, using Basic Trading Areas as a guide.

Total non-MSA areas	Average non-MSA areas/state	Average square miles/area	Actual average population/area
336	6.7	7467*	195,692

*Alaska not included.

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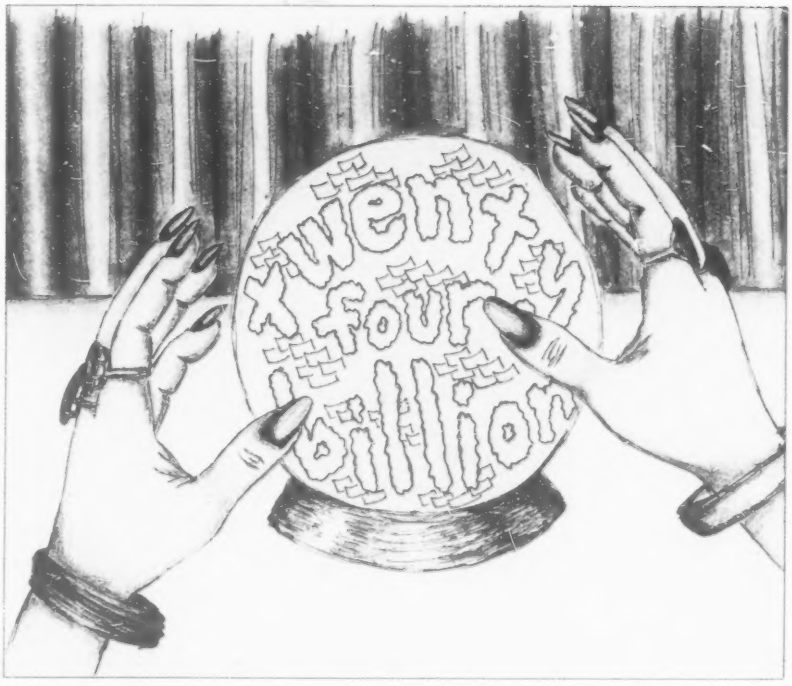
Carriers plan $24 billion outlay in 1986

As both local exchange carriers (LECs) and interexchange carriers (IXCs) continue to upgrade their networks in 1986, they will spend an estimated $24 billion for new and replacement equipment.



Cover art by Sharon Matjack

CZATDANA INAN, MARKET RESEARCH DIRECTOR, and LARRY LANNON, EXECUTIVE EDITOR

CARRIERS will continue to upgrade their networks in 1986 in pursuit of the sophisticated business user. As they did in 1985, fiber optic cable and digital switches will fuel the chase.

Carriers in the United States, including both local exchange carriers (LECs) and interexchange carriers (IXCs), plan to spend $24.009 billion in 1986 for new and replacement equipment (Table 1). In 1985, U.S. carriers spent an estimated $24.06 billion for equipment, so spending is expected to slow slightly this year. However, early indications are that spending will pick up again in 1987, when carriers will spend an estimated $24.3 billion.

LECs again will outspend IXCs by a large margin in 1986. LECs will spend an estimated $20.194 billion in 1986, a full 84% of total carrier expenditures. IXCs will spend $3.815 billion this year.

The regional holding companies (RHCs) will account for the largest portion of carrier expenditures in 1986, reflecting their overwhelming importance in the LEC industry. The RHCs will spend an estimated $14.64 billion in 1986, up from their estimated expenditures of $14.60 billion in 1985. Four of the RHCs will increase their expenditures slightly in 1986, while three will cut theirs.

Bell Atlantic, which spent an estimated $2.028 billion in 1985, is expected to spend $2.081 billion in 1986. BellSouth is expected to increase its outlay from $2.549 billion in 1985 to $2.684 billion in 1986. Nynex is expected to boost its annual investment from $2.045 billion last year to $2.077 billion in 1986. And Southwestern Bell is expected to spend $2.123 billion in 1986, up from the $1.996 billion it invested in 1985.

The three trimmers will be Ameritech, Pacific Telesis and U S West. Ameritech spent an estimated $1.958 billion last year and is expected to cut that outlay slightly to $1.946 billion in 1985. Pacific Telesis is expected to spend $2.021 billion in 1986, down from the estimated $2.186 billion it spent last year. And U S West, which spent an estimated $1.84 billion in 1985, is expected to cut its expenditures to $1.707 billion.

Four of the seven RHCs spent more than $2 billion in 1985. In 1986, five of the seven are expected to surpass the $2 billion level. Only Ameritech and U S West are expected to invest less than $2 billion this year. And

Continued on page 34

The source

This article is based on the 1986 Carrier Market Forecast, this year's version of an annual study done by TELEPHONY'S *Market Research Dept. The study is available to the public. For more information, contact Market Research Director Czatdana Inan,* TELEPHONY, *55 E. Jackson Blvd., Suite 1100W, Chicago, Ill. 60604; telephone: (312) 922-2435.*

Table 1 Construction Spending 1984-87 of Major U.S. Carriers

1984 Revenues (000,000)	Access Lines (June 30, 1985)	7 Regionals	CONSTRUCTION EXPENDITURES ($000,000) Actual 1984	Estimated 1985	Estimated 1986	Estimated 1987
	4,764,366	Illinois	496.6	674.1	656.8	677.5
	1,438,329	Indiana	196.4	207.0	229.5	241.1
	3,664,345	Michigan	426.9	454.6	500.0	561.8
	2,952,757	Ohio	417.3	422.0	355.9	360.7
	1,509,630	Wisconsin	203.6	200.7	204.0	198.5
$ 8,346.8	14,329,427		1,740.8	1,958.4	1,946.2	2,039.6
		Bell Atlantic				
	5,786,473	C&P	757.0	876.0	893.0*	875.0*
	4,100,000*	New Jersey	538.8	522.5	530.0*	530.0*
	4,881,578	Bell of Pa	532.0	629.0	658.0	677.0
$ 7,968.3	14,768,051		1,827.8	2,027.5	2,081.0	2,082.0
		BellSouth				
	6,379,785	South Central	944.1	1,046.8	1,094.1	1,060.0
	7,912,194	Southern	1,263.7	1,502.1	1,590.2	1,579.0
$ 9,143.6	14,291,979		2,207.8	2,548.9	2,684.3	2,639.0
		Nynex				
	5,083,316	New England	765.5	803.0	839.9	883.0*
	9,672,209	New York	1,119.0	1,242.0	1,237.1	1,302.0*
$ 9,507.0	14,755,525		1,884.5	2,045.0	2,077.0	2,185.0
		Pacific Telesis				
$ 7,697.1	11,294,259	Pacific (a)	1,993.0	2,186.0	2,021.0	2,000.0*
		Southwestern Bell				
$ 6,968.7	10,750,652	SW Bell	1,744.4	1,996.1	2,123.4	2,445.2
		U S West				
	5,011,250	Mountain	899.8	955.0	875.0	950.0
	2,993,811	NW Bell	350.9	500.0	450.0*	460.0*
	2,564,459	Pacific NW	349.6	384.9	381.9	395.0*
$ 6,909.3	10,569,520		1,600.3	1,839.9	1,706.9	1,805.0
		Top 18 Independents				
$ 7,729.6	10,900,000	GTE (U.S. only)	2,173.0	2,365.0	2,499.0	2,327.0
2,145.2	3,197,385	United	508.6	564.0	567.6	567.9
1,562.9	1,600,000	Contel	469.9	437.9	443.4	436.3
1,273.4	2,227,591	SNET (b)	214.3	245.0	285.0	327.0*
785.5	1,285,806	Centel	162.8	170.0	184.5	166.2
$13,496.6	19,210,782		3,528.6	3,781.9	3,979.5	3,824.4
$ 490.8	882,165	Alltel	132.8	149.3	149.0	149.0
448.3	710,805	Cincinnati Bell	59.5	85.2	66.7	69.3
352.4	570,875	Puerto Rico Tel	109.3	135.0	160.0	145.0
295.7	467,300	Rochester	56.8	90.6	68.8	65.6
111.0	227,618	Century	37.3	41.3	41.1	44.7
$ 1,698.2	2,858,763		395.7	501.4	485.6	473.6
$ 93.5	182,885	TDS	28.5	27.5	29.9	28.0*
126.6	194,405	Lincoln	30.4	32.6	33.2	29.7
122.9	170,000	Pacific Telecom	33.3	36.5	46.0	46.8
75.3	158,065	Commonwealth	20.7	23.8	33.9	28.0
102.4	113,437	Anchorage	41.7	53.2	52.9	30.6
$ 520.7	818,762		154.6	173.6	195.9	163.1
$ 52.5	73,092	Illinois Cons	11.0	10.8	10.7	10.6
97.6	81,608	Citizens Ut	24.5	21.2	28.0	27.0
73.9	56,000*	CP National	15.2	19.2	21.0*	21.0*
$ 224.0	210,700		50.7	51.2	59.7	58.6
		LECs' Subtotal				
$56,540.0	90,759,413	7 Regionals	12,998.6	14,601.8	14,640.1	15,195.8
15,939.5	24,099,000	18 Independents	4,129.6	4,508.1	4,720.7	4,519.7
1,387.3	3,172,200	Other LECs (c)	728.8	795.5	833.1	797.6
$73,867.6	118,030,600		17,857.0	19,905.4	20,193.9	20,513.1
		Major IXCs' Subtotal (d)	3,853.2	4,154.9	3,815.0	3,800.0
		All Carriers: TOTAL	21,710.2	24,060.3	24,008.9	24,313.1

***Estimated by Telephony**

a. Includes Nevada Bell

b. Does not include diversified activities

c. Other Independents estimated at 15% of total Independent

d. See Table 2 for details

Source: Telephony/Market Research

Ameritech will fall only about $50 million short of the $2 billion market.

There is nothing particularly significant about $2 billion, except that it obviously is a lot of money. The important point is what lies behind the naked numbers: The RHCs are determined to stick to their plans to upgrade their networks and vigorously compete for the lucrative large business customer by providing sophisticated, network-based services. The precise amount that one or another RHC spends, whether that amount increases slightly or decreases slightly or if that amount is a little more than or a little less than $2 billion per year, is much less important than the fact that all seven RHCs have mapped similar strategies and are methodically investing in their networks to bring those strategies to fruition.

Behind all that money lies a commitment to compete where the competition is fiercest.

The 18 largest Independents, a group which includes the traditional Independents plus Cincinnati Bell and Southern New England Tel (SNET), have come to conclusions which closely resemble the RHCs', judging by their spending plans.

'The RHCs are determined to stick to their plans to upgrade their networks and vigorously compete for the lucrative large business customer by providing sophisticated, network-based services.'

The 18 largest Independents are expected to spend $4.721 billion in 1986, up from the estimated $4.508 billion they spent in 1985. Only 6 of the 18 companies—Alltel, Cincinnati Bell, Rochester, Century, Anchorage, Illinois Consolidated—are expected to spend less in 1986 than they spent in 1985. Alltel, Century, Anchorage and Illinois Consolidated expect the difference to be marginal. Cincinnati Bell is expected to spend $66.7 million in 1986, after spending an estimated $85.2 million in 1985. Rochester spent an estimated $90.6 million in 1985, an outlay which it is expected to reduce to $68.8 million in 1986.

The five largest Independents are all expected to increase their expenditures in 1986. GTE, which spent an estimated $2.365 billion in 1985, is expected to invest $2.499 billion in 1986. Only BellSouth among all carriers is expected to spend more in 1986 than GTE.

United is expected to spend $568 million in 1986, a slight increase over the estimated $564 million it spent in 1985. Contel is expected to spend $443 million this year, up from the estimated $438 million it spent last year. SNET, which spent an estimated $245

Continued on page 36

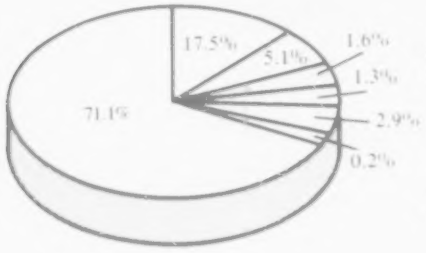
Figure 1 U.S. Local Exchange Carriers (LECs) to Spend $20.194 Billion for New Replacement Equipment in 1986

Local Exchange Carriers (LECs) 1986 Capital Expenditures

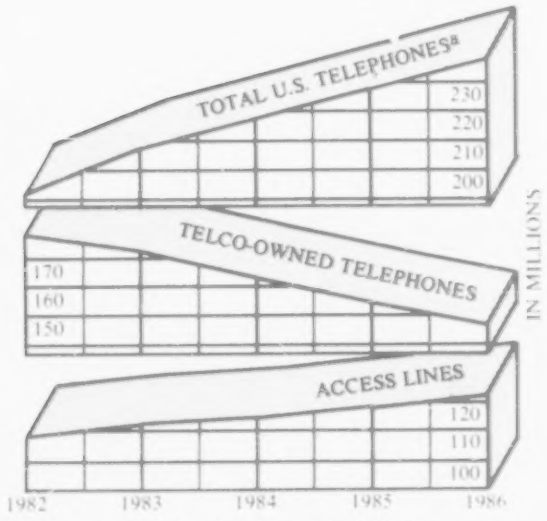
	In %
Switching, including special services & test equipment	
Local	26.2
Toll & Local/Toll	1.8
	28.0
Transmission, including line conditioning, carrier & test equipment	18.4
Microwave	1.0
Mobile, Cellular & Paging	0.5
	19.9
Internal Use/CPE	
Voicecom	1.3
Datacom	2.3
	3.6
Cable	
Underground	7.1
Buried	11.5
Aerial	7.5
Fiber Optic	3.6
	29.7
Support Services	
Land & Buildings	5.9
Vehicles	1.8
	7.7
Other, including Computers, Furniture, Tools & Work Equipment, Station Connections, Administrative & Engineering	11.1

Source: Telephony/Market Research

Figure 2 Access Lines & Telephones in U.S.



U.S. Access Lines (6/30/85)
71.1% Residential
17.5% Business*
5.1% Centrex Lines & Trunks
2.9% PBX Trunks
1.6% Coin
1.3% WATS
0.2% Other
*Includes Standalone key system lines



a Customer-owned and telco-owned telephones

Source: Telephony/Market Research

million in 1985, is expected to increase its expenditures for equipment to $285 million in 1986. Centel is expected to spend $185 million in 1986, up from the $170 million it spent last year. Puerto Rico Tel, after spending an estimated $135 million in 1985, is expected to spend $160 million in 1986.

Altogether, the five top Independents are expected to spend $3.980 billion in 1986 after laying out an estimated $3.782 billion in 1985.

TDS is expected to spend $29.9 million in 1986, up from the $27.5 million it spent last year. Lincoln is expected to spend $33.2 million in 1986 after spending an estimated $32.6 million in 1985. Pacific Telecom, which spent an estimated $36.5 million in 1985, is expected to boost its expenditures to $46 million.

Commonwealth is expected to spend $33.9 million in 1986, up from the $23.8 million it is estimated to have spent last year. Citizens Utilities is expected to spend $28 million in 1986, considerably more than the $21.2 million it is estimated to have spent in 1985. CP National, which spent an estimated $19.2 million in 1985, is expected

Continued on page 40

Table 2 LECs 1982-1986

Performance Composite ($000,000)

	Plant Investment	Revenues	Expenses
Est. 1986	$217,900	$83,146	$69,305
Est. 1985	203,700	79,243	68,528
Actual 1984	193,779	73,868	64,450
1983	199,272	78,903	69,213
1982	191,746	75,074	66,603

Source: USTA

Table 3 Major Interexchange Carriers (IXCs)

	TOTAL REVENUES ($000,000) 12 Months 1983	12 Months 1984	Projected* 12 Months 1985	CUSTOMERS (and % Business Users)	% Bus		% Bus
AT&T Communications	$34,528.7	$36,413.8	$38,600.0	87,000,000	9%	87,900,000*	9%
MCI	1,521.5	1,959.3	2,850.0	1,613,000	19%	3,088,000	17%
GTE Sprint	578.0	1,245.0	1,650.0	1,400,000	25%	1,700,000	20%*
ALC Communications (a)	181.0	287.5	514.0[a]	196,000	47%	560,788[a]	37%
US Telecom	160.6	222.1	380.0	175,000	70%	350,000	30%
	$35,969.8	$40,127.6	$43,994.0	90,384,000		93,598,788	

	CONSTRUCTION BUDGET ($000,000) 1984	1985	1986	EMPLOYES 1984	1985	INSTALLED SWITCHES 1983	1984	1985
AT&T Communications	$1,341.9	$2,041.0[b]	$1,900.0*	117,025	118,074	167	167	167
MCI	1,157.2	1,050.0	900.0	9,870	12,656	98	126	116
GTE Sprint	980.0	700.0[c]	600.0	6,500	6,200	55	72	63
ALC Communications	24.1[d]	38.9[d]	90.0*	1,579	2,283[a]	27	30	44[a]
US Telecom	350.0*	325.0*	325.0*	2,041	2,600	NA	10	15
	$3,853.2	$4,154.9	$3,815.0	137,015	141,813			

*Estimated by Telephony

a Reflects merger of Allnet and Lexitel in December 1985

b Extrapolated on basis of $1,407.6 billion spent as of August 1985

c Revised on basis of route-sharing arrangement with US Telecom

d Includes network equipment under lease

Source: Telephony/Market Research

to spend $21 million in 1986. The other LECs are expected to spend $833.1 million in 1986, up from the $795.5 million they are estimated to have spent in 1985.

Besides their shared interest in capturing as many business customers as possible, the LECs have a recent history of sustained growth to buoy their investment planners. With the exception of 1984, and using estimated totals for 1985-86, the LECs have steadily increased their plant investment, expenses and, most importantly, their revenues (Table 2).

The business picture looks different from the IXCs' point of view. The five major IXCs are expected to spend $3.815 billion in 1986, down from the estimated $4.155 billion they spent in 1985 (Table 3). The big three IXCs—AT&T Communications, MCI and GTE Sprint—are expected to reduce their outlays. AT&T Communications is expected to spend $1.9 billion in 1986, down from the estimated $2.041 billion it spent last year. MCI, which spent an estimated $1.05 billion in 1985, is expected to spend $900 million in 1986. GTE Sprint is expected to spend $600 million this year, after spending an estimated $700 million last. US Telecom, after spending an estimated $325 million in 1985, is expected to spend the same amount this year. ALC Communications, the company recently formed when Allnet and Lexitel finalized their merger, spent an estimated $38.9 million in 1985 and is expected to spend $90 million this year.

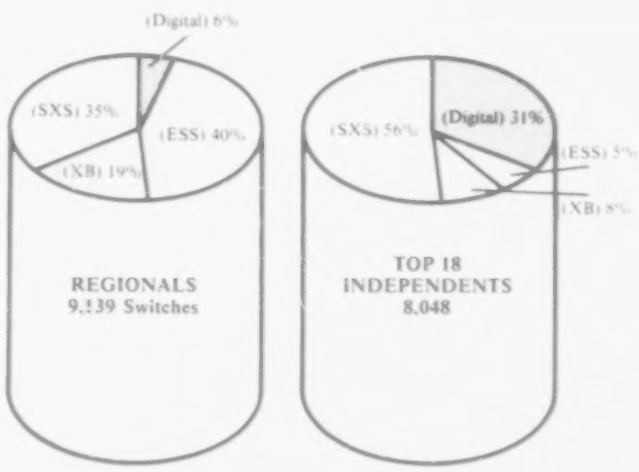
Switching and transmission technology will dominate the LECs' expenditures in 1986 (Figure 1). Switching will consume 28% of total 1986 LEC expenditures, while transmission cable will take 29.7%. Fiber optic cable will consume 3.6% of total LEC expenditures. Together, switches and cable will account for 57.7% of LEC outlays in 1986.

Sophisticated digital switches and high capacity fiber optic cable hold the keys to the hearts and wallets of demanding business customers. Business customers account for a small proportion—17.5%— of total access lines (Figure 2). But they are easily the most important revenue generators. They are also the telecommunications consumers with the most options.

The RHCs have decided to bring full capability to business users as rapidly as possible. Table 4 summarizes the RHCs' spending plans for fiber optics in 1986. Digital switches are of equal importance in the competition for business customers. Currently, the 18 largest Independents have a larger percentage of digital switches than their RHC counterparts. The Independents have 8048 switches, of which 31% are digital, while only 6% of the RHCs' 9139 switches currently are digital (Figure 3).

The coming year promises to witness the acceleration of the already hot pursuit of the large business customer by the carrier industry. In order to woo those business customers successfully, the carriers will rely heavily on digital switches and fiber optic transmission links. All the carriers intend to bolster their networks by investing heavily, particularly in the two key technologies.

Figure 3 Local Switches by Technology As of 6/30/85



Source: Telephony/Market Research

Table 4 Fiber Optics & the Seven Regionals

1986 Spending % Budget	1986 Spending In Dollars (000,000)		Fiber Miles (as of 6/30/85) Subscriber Loop	Inter-Office	Total
		Ameritech			
3.8%	24.958	Illinois	6,295	18,451	24,746
5.7%	13.082	Indiana	10,719	589	11,308
4.5%*	22.500	Michigan	NA	NA	20,000[a]
4.0%	14.236	Ohio	NA	NA	8,000[b]*
4.3%	8.772	Wisconsin	NA	NA	8,500
	83.548				72,554
		Bell Atlantic			
4.0%*	35.720	C&P	NA	NA	26,638[a]
4.0%*	21.200	New Jersey	8,100	17,900	27,000[a]
4.0%	26.320	Bell of Pa	13,330	4,154	17,484
	83.240				71,122
		BellSouth			
3.2%	34.925	South Central	NA	NA	34,503
4.1%	65.198	Southern Bell	53,029	9,447	62,476
	100.123				76,981
		Nynex			
2.8%	23.517	New England	NA	NA	42,800
3.2%	39.587	New York	NA	NA	78,300
	63.104				100,123
		Pacific Telesis			
3.9%*	78.819	Pacific	11,185	100,661	111,846
		Southwestern Bell Corp.			
4.8%	101.923	Southwestern Bell	NA	NA	48,000[a]
		U S West			
4.5%*	39.375	Mountain Bell	9,143	2,834	11,977
3.5%*	15.750	Northwestern Bell	NA	NA	10,000[c]*
3.5%	13.367	Pacific NW	12,500	400	12,900
	68.492				34,877
	$579.248	**Grand Total**			515,503

*Estimated by Telephony
a. As of 12/31/85
b. Reported 2,256 sheath miles in subscriber loop, 140 in inter-office
c. Reported 194 sheath miles in subscriber loop, 914 in inter-office

Source: Telephony/Market Research

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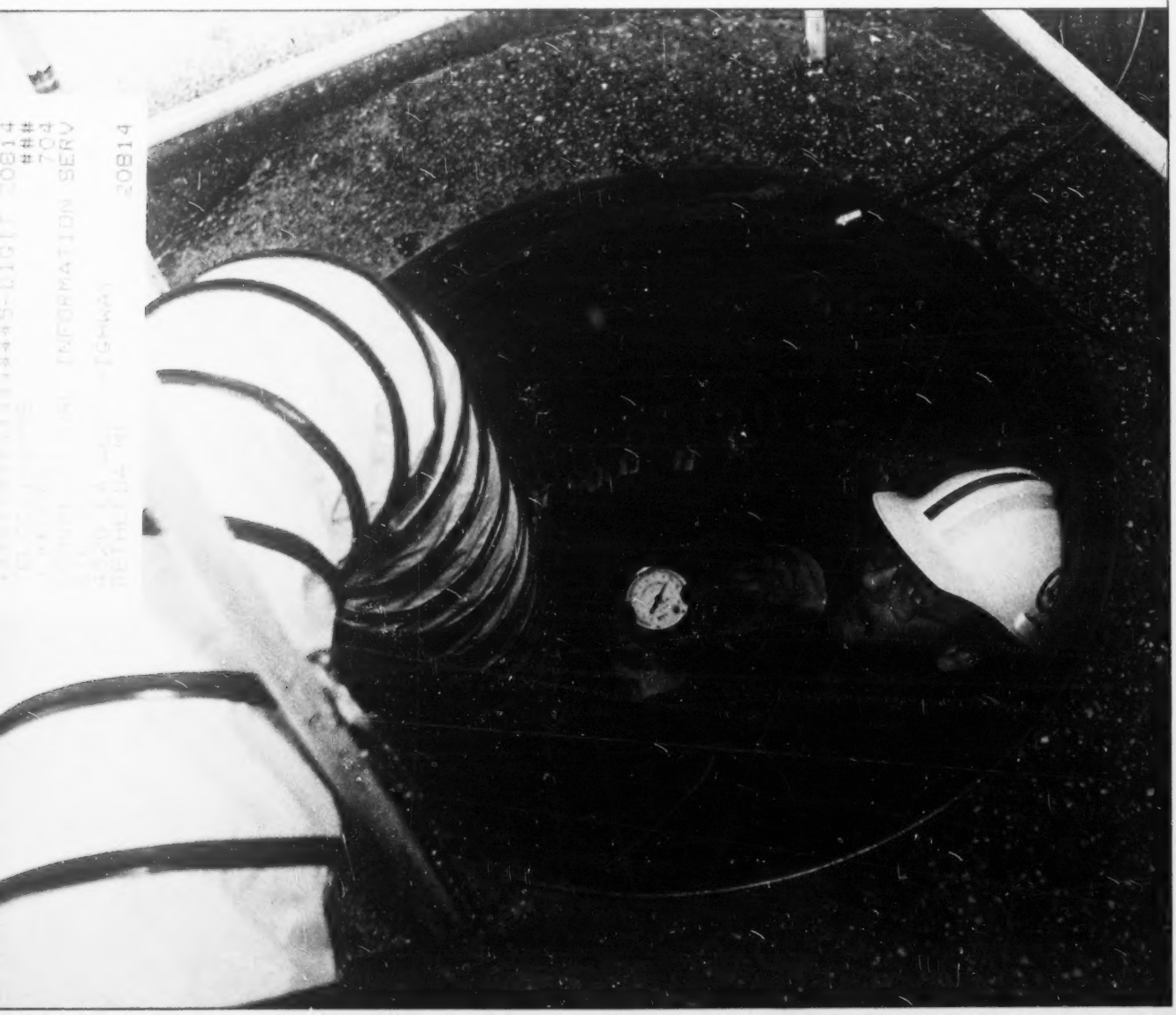

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LETTERS

Not a level playing field

The directory advertising industry has changed radically since the tranquil, pre-divestiture days when it was dominated by AT&T.

Today, at least 12 major companies are competing in this arena. They include the directory publishing affiliates of both the Bell regional holding companies and Independent telephone companies and such independent publishers as R.H. Donnelley.

Currently, however, the affiliates are at a distinct competitive disadvantage vis-a-vis the independent publishers—a fact that state regulatory agencies have so far failed to acknowledge or address. Whereas the affiliates are subject to direct or indirect regulation by state agencies, the independent companies are not, freeing them to concentrate on the most lucrative markets—and to enter and leave those markets at will. The affiliates, moreover, face an additional burden in the form of the hefty publishing rights fees that regulators use to subsidize local phone rates. The independent companies pay no such fees and can price their advertising space as much as 60% below that of the affiliates.

It is time for regulatory commissions to recognize that all markets and all directories are not created equal. Therefore, in considering appropriate licensing methods, regulators should take into account the market value of each directory and the extent of competition that exists in each market. Regulators should also acknowledge the need for flexible and directory-specific valuations of the rights to publish telephone company directories so that the affiliates can maintain competitive price and cost structures.

If regulators fail to recognize the increasingly competitive nature of the directory advertising business, the affiliates' ability to compete with the independent publishers will continue to erode. Over time, that will surely lead to a permanent loss of market share and sales for the affiliates—and, in turn, reduce the publishing rights fees they do pay.

Steven B. Meadows
Senior Consultant
Communications Industry Practice
Cresap, McCormick and Paget
Atlanta

Correction

The article, "Carriers plan $24 billion outlay in 1986," which appeared in the Jan. 13 issue (p. 32) contained an error in Table I. The SNET and Contel figures for access lines were reversed. Contel has 2,227,591 access lines and SNET has 1,600,000. TELEPHONY regrets the error.

Wedded bliss

Your editorial, "A solid, contemporary marriage," in the Jan. 20 issue (p. 29), was both complimentary and correct in its observations about USTA's unity and effectiveness 2 years after the Bell companies joined our association. As with any good marriage, the credit must go to the members—in this case the 1100-plus telephone companies which USTA represents. In particular, the officers and directors of this association have done much to make the relatively-young marriage of Bell and Independent companies work so well.

When you consider that the marriage wedded a trade association nearly 90 years of age with seven young Bell regional holding companies and two dozen operating companies, accomplishing the currently healthy relationship is even more remarkable. The credit goes to our members.

John Sodolski
President
U.S. Telephone Assn.
Washington, D.C.

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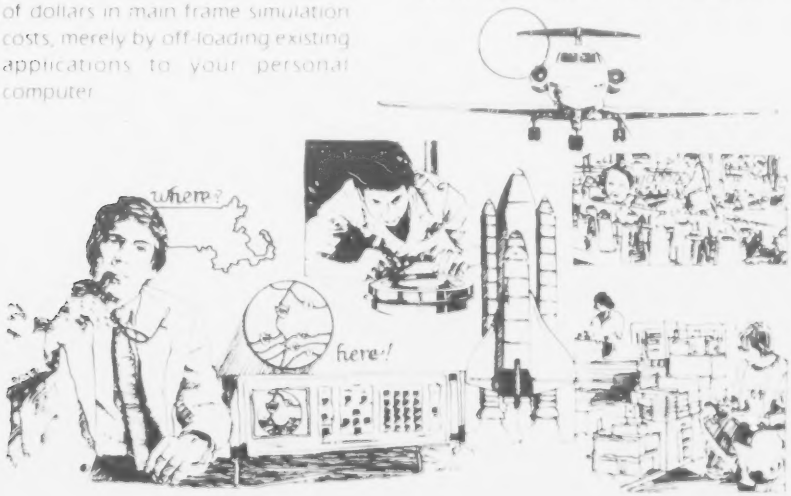

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World telecom spending moves ahead again after down period

Cover art by Sharon K. Maniaci

World telecommunications spending, after a couple of slow years, is expected to increase slightly for the next serveral years. But predicting the longer term future is risky.

CZATDANA INAN, MARKET RESEARCH DIRECTOR, and LARRY LANNON, EXECUTIVE EDITOR

WORLD TELECOMMUNICATIONS spending will increase in 1986, but by very little.

In addition, the international telecommunications industry continues to be characterized by two types of participants: wealthy countries with sophisticated, nationwide communications infrastructures and developing countries with communications infrastructures inadequate to meet their needs and with little if any capital available to invest. The communications infrastructures of the developing countries continue to lag far behind the networks being maintained and expanded by the developed countries, a structural characteristic which bodes ill for the general economic competitiveness of the developing world.

Approximately $83 billion will be spent worldwide on telecommunications goods and services this year, up from the roughly $77 billion which was spent last year (Table 1). In real terms, however, worldwide spending will increase by only about 1.2%.

However small the spending increase will be in real terms, it does represent the first increase in the past 2 years. In fact, the recent trend has been for spending to decrease. In 1984, real spending decreased by 5.7% and in 1985 it was down by 3%.

Our annual international spending report is based on verified reports made by national telecommunications administrations and, where applicable, major private telecommunications service providers in January 1986, as well as estimates made by TELEPHONY, as indicated in Table 1.

Any analysis of international telecommunications spending must consider economic factors external to the telecommunications industry itself. Currently, the two dominant external factors are fluctuations in the value of the U.S. dollar and the rate of inflation.

Over the past 11 months, the value of

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Table 1 1984-87 World Construction Expenditures ($000,000)

	In Current US$[a]				Budget % Change in Country's Currency		
	1984	1985	1986	1987[b]	1984-1985	1985-1986	1986-1987
Zone 1: North America							
United States							
Regionals	12,998.6	14,601.8	14,640.1	15,195.8	+ 12	+ 3	+ 4
Independents	4,840.4	5,303.6	5,553.8	5,317.3	+ 10	+ 5	− 4
Interexchange	3,852.2	4,154.9	3,815.0	3,800.0	+ 8	− 8	-0-
Canada							
Telecom Canada[c]	1,805.4	1,951.8	1,885.7	1,927.5	+ 10	+ 9	+ 2
Barbados	12.1	11.6	8.5	− 10.0	− 4	− 27	+ 18
Bermuda	9.5	4.7	5.6	6.4	− 51	+ 19	+ 14
Jamaica	27.9	21.4	20.0	25.0	+ 6	+ 20	+ 25
Trinidad & Tobago	98.9	101.5	67.3	33.3	+ 3	− 1	− 51
Subtotal:	23,645.0	26,151.3	25,996.0	26,315.3			
Extrapolated:							
Current US$	**24,889.5**	**27,527.7**	**27,364.2**	**27,700.3**			
Constant (1983) US$[d]	**24,178.6**	**25,024.9**	**25,900.8**	**26,807.3**			
Zone 2: Africa							
Kenya	5.8	4.4	10.5	11.6	− 13	+144	+ 12
South Africa	810.0	719.8	733.0	750.0*	+ 46	+ 13	+ 6
Zambia	23.6	38.6	37.0	22.6	+321	+ 12	− 39
Zimbabwe	32.1	47.9	51.4	47.6	+100	+ 15	− 8
Subtotal:	871.5	810.7	831.9	831.8			
Extrapolated:							
Current US$	**1,743.0**	**1,621.4**	**1,663.8**	**1,663.6**			
Constant (1983) US$	**2,031.7**	**2,102.8**	**2,176.4**	**2,252.6**			
Zone 3-4: Europe							
Austria	577.6	543.8	786.1	805.2	+ 8	+ 12	+ 2
Belgium	406.3	345.2	468.2	435.7	− 4	+ 5	− 4
Denmark							
Jydsk	61.1	63.2	120.8	137.7	+ 18	+ 52	+ 14
KTAS	85.9	90.0	139.0*	158.0*	+ 20	+ 50	+ 15
Finland							
PTT	132.6	127.9	150.1	163.4	− 4	+ 9	+ 9
Association	161.5	154.1	202.8	221.2	+ 8	+ 8	+ 9
France	3,096.0	4,140.0	4,482.3	4,800.0*	+ 5	+ 5	+ 5
Germany, FR	4,797.3	5,604.6	5,888.4	6,000.0*	+ 17	+ 5	+ 5
Italy	2,512.0	2,289.0	2,782.4*	2,850.0*	+ 6	+ 6	+ 6
Netherlands	338.7	357.5	544.7	562.8	+ 22	+ 17	+ 3
Norway	420.4	390.5	498.7	518.5	+ 9	+ 6	+ 4
Portugal (TLP)	78.0	74.4	96.8	106.4	+ 22	+ 20	+ 10
Spain	1,120.0	1,182.0	1,403.9	1,650.0*	+ 9	+ 9	+ 9
Sweden	572.0	580.8	845.1	966.0	+ 10	+ 25	+ 14
Switzerland	587.1	542.6	675.0*	695.0*	+ 9	− 4	+ 4
United Kingdom	2,512.0	2,289.0	3,000.0	3,400.0*	+ 21	+ 16	+ 15
Subtotal:	17,458.5	18,774.6	22,084.3	23,469.9			
Extrapolated:							
Current US$	**20,539.4**	**22,087.7**	**25,981.5**	**27,611.6**			
Constant (1983) US$	**23,416.9**	**24,236.5**	**25,084.7**	**25,962.7**			
Zone 5: South & Central America							
Brazil	844.0	850.0	850.0*	875.0*	+226	+232	+250
Costa Rica	15.3	12.5	19.6	28.5	+ 22	+ 47	+ 5
Chile	56.5	27.5	39.5	117.9	− 29	+107	+199
Colombia	19.1	11.9	28.4	93.6	− 21	+264	+230
Mexico	477.3	505.6	850.7	945.9	+ 64	+166	+ 55
Peru	38.0	21.6	92.2	96.9	+ 35	+471	+ 5
Uruguay	39.9	69.6	64.0	53.0	+203	+ 87	− 17
Venezuela	160.2	197.6	315.2	369.6		+178	+ 17
Subtotal:	1,650.3	1,696.3	2,259.6	2,580.4			
Extrapolated:							
Current US$	**2,357.6**	**2,423.3**	**3,228.0**	**3,686.3**			
Constant (1983) US$	**2,638.2**	**2,730.6**	**2,816.1**	**2,925.0**			

Table continues on page 32

Table 1 1984-87 World Construction Expenditures ($000,000) Continued

	In Current US$[a]				Budget % Change in Country's Currency		
	1984	1985	1986	1987[b]	1984-1985	1985-1986	1986-1987
Zone 6: Pacific							
Australia	1,125.0	977.0	1,057.0	1,055.0	+ 8	+ 11	-0-
Indonesia	138.2	254.7	640.9	704.9	+100	+163	+ 11
New Zealand	136.4	150.2	241.1	241.1	+ 52	+ 45	-0-
Singapore	150.7	285.5	257.8	323.6	+ 95	- 12	+ 25
Thailand	220.9	199.3	426.4	422.4	- 7	+112	- 1
Subtotal	1,771.2	1,866.7	2,623.2	2,746.4			
Extrapolated:							
Current US$	2,214.0	2,333.4	3,279.0	3,433.0			
Constant (1983) US$	2,894.5	2,995.8	3,100.7	3,209.2			
Zone 7: USSR[c]							
Current US$	6,200.0*	6,448.0*	6,795.9*	6,974.1*	+ 4	+ 4	+ 4
Constant (1983) US$	6,210.0	6,427.4	6,652.3	6,885.1			
Zone 8: Far East							
Hong Kong	64.2	76.6	121.4	109.4	+ 19	+ 59	- 10
Japan	7,236.5	6,841.2	7,080.6*	7,100.0*	- 5	+ 3	+ 3
Korea, Rep	1,318.9	1,391.3	1,422.5	1,494.3	+ 9	+ 7	+ 5
Taiwan	397.1	473.3	685.4	698.3	+ 17	+ 45	+ 2
Subtotal	9,016.7	8,782.4	9,309.9	9,402.0			
Extrapolated:							
Current US$	11,270.9	10,978.0	11,637.4	11,752.5			
Constant (1983) US$	11,833.2	12,247.3	12,675.9	13,119.6			
Zone 9: Middle East							
India	607.3	585.6	658.8	635.2	- 13	+ 12	- 4
Kuwait	134.7	174.9	96.0	102.7	+ 36	- 47	+ 7
Oman	162.0	192.0	81.0	100.0*	+ 19	- 58	+ 7
Syria	68.1	94.9	104.2	87.2	+ 39	+ 10	- 16
Subtotal	972.1	1,047.4	940.0	925.1			
Extrapolated:							
Current US$	3,240.3	3,491.3	3,133.3	3,083.7			
Constant (1983) US$	3,369.1	3,487.0	3,609.1	3,735.4			
GRAND TOTAL							
Identified Countries	61,585.3	65,577.4	70,759.8	73,245.0[b]			
Extrapolated:							
Current US$	72,454.7	76,910.8	82,993.1	85,905.1[b]			
Constant (1983) US$	76,572.2	79,252.3	82,026.0	84,896.9			
GROWTH in Current US$ versus Constant (1983) US$	-5.7%	-3.0%	+1.2%	+1.2%			

Source: Telephony Market Research

*Estimated by Telephony

a: Exchange rates correspond to U.S. Federal Reserve System rates on the first business day of each year.
b: At 1986 exchange rates.
c: Does not include Telesat Canada, the satellite arm of Telecom Canada.
d: Assumes 3.5% average inflation during 1983-87 (U.S. GNP deflator).
e: Estimated on basis of 27.8 million subscribers and reports that 1986-90 five-year plan sets telecommunications as a "key economic objective."
f: Assumes Nippon Telegraph & Telephone will stabilize spending at 1985 level.

the dollar has fallen 20% against other major currencies. Recently, however, the dollar has risen in response to plunging oil prices. That reversal is likely to be short-lived, as the effects of recent cuts in oil prices again subordinate themselves to the stated policies of the powerful "Group of Five" industralized nations.

The Group of Five consists of the U.S., Japan, West Germany, France and the U.K. In order to improve deteriorating U.S. trade balances, the Group of Five has adopted a policy of favoring a lower exchange rate for the dollar, thus, among other things, making goods produced in the U.S. more attractive in foreign markets. The Group of Five has affirmed its intention to pursue that policy since the latest drop in world oil prices.

The decline in the dollar during the last 11 months has pushed exchange rates for major currencies back to 1983 levels, combating inflationary tendencies and promoting the first real growth in world telecommunications spending since 1983. Our study conservatively assumes that there will be a 3.5% inflation rate for the period 1983-87. Thus,

If world telecommunications spending in 1986 were to remain at the same level as 1983 spending, the world would spend about $82 billion this year. The $0.9 billion difference between $82 billion and the actual projected expenditure of $82.9 billion represents the real growth in world telecommunications spending. The world is expected to increase its telecommunications spending by 1.2% again in 1987. That would provide a figure of about $85.9 billion expressed in current dollars which is 1.2% over the $84.9 billion benchmark figure for 1987.

For the time being anyway, the importance of inflation for the global telecommunications industry thus seems to be receding. In national terms, however, inflation continues to play a dominant role in many cases.

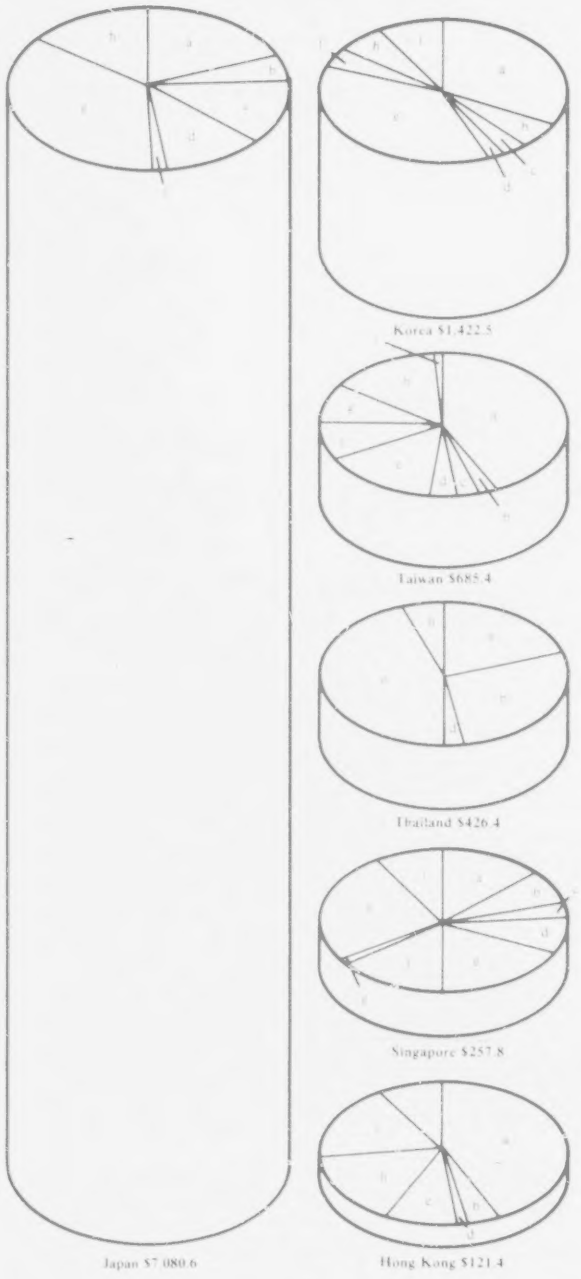
As always general conclusions drawn about the international telecommunications industry may be perfectly valid and even useful, but also may actually obscure the reality that the differences among nations are as great if not greater than ever. For instance, the rate of inflation varies throughout Europe; consequently, inflation outstripped telecommunications spending by a full 2.1% in 1984 in France, while telecommunications spending in Sweden surpassed the rate of inflation by a whopping 7.9%. And the differences between the developing nations and the developed nations are so great they make differences between developed countries look insignificant.

A group of 10 countries—Canada and the U.S. in North America; France, West Germany, Italy, the Netherlands, Sweden and the U.K. in Europe; and Japan and Taiwan in the Far East—will spend $51.2 billion in 1986, a full 62% of total world telecommunications spending. If South Korea and Australia are included, the top dozen countries will account for roughly two-thirds of world spending, or $53.6 billion.

Four of that group of 12 countries are located in the Far East, which reflects that region's growing importance in both the international telecommunications industry and the world economy. If the U.S. and Canada are included among Pacific Basin countries, it becomes clear that the long dominant Atlantic axis (Europe-North America) is rapidly ceding place to a muscular Pacific axis. Figure 1 examines the distribution of telecommunications investments in Japan, South Korea, Taiwan, Thailand, Singapore and Hong Kong in greater depth.

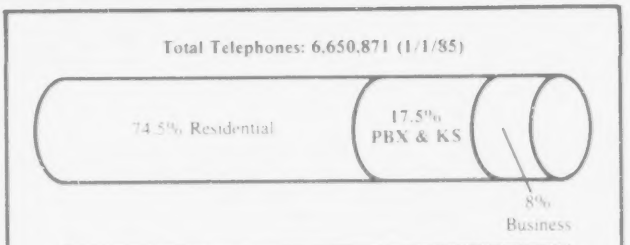
A cursory examination of the geo-

Figure 1 The Far East and Pacific: Growing Markets


Japan $7,080.6
Korea $1,422.5
Taiwan $685.4
Thailand $426.4
Singapore $257.8
Hong Kong $121.4
a. Local, Toll & Local Toll Switching
b. Transmission & Carrier Equipment
c. Microwave, Mobile & Satellite Equipment
d. Voice & Datacom CPE
e. Underground Cable
f. Submarine Cable
g. All Other Cable
h. Land, Buildings & Vehicles
i. Other, including computers, office equipment & furniture, misc. tools and material, etc.

Source: Telephony/Market Research

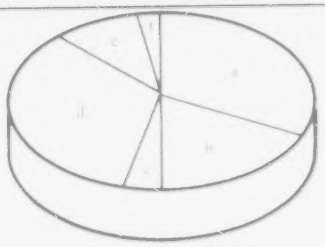
Figure 2 Mexico: Some Business Economics



PBXs & Key Systems: Manual vs. Automatic

	Manual		Automatic	
	Systems	Phones	Systems	Phones
PBXs				
Under 25 Lines	13,752	158,538	1,433	27,288
Under 50 Lines	3,805	126,830	655	21,830
Under 100 Lines	2,105	118,904	362	20,466
101-250 Lines	2,054	245,735	304	42,296
Over 250 Lines	359	142,687	61	26,650
	22,075	792,694	2,815	136,440
Key Systems	na	198,173	2,136	34,110
Total PBX & KS Phones		990,867		170,550

Figure 2a
Mexico $850.7 in 1986



a. Local, Toll & Local Toll Switching	31.9%
b. Transmission & Carrier	18.9%
c. Voice CPE	3.0%
d. Total Cable	34.6%
e. Land, Buildings & Vehicles	7.6%
f. Other	2.0%

Source: Telephony/Market Research

graphic distribution of the 12 countries which dominate international telecommunications spending also illustrates the extent of the problem facing most developing nations. None of the 12 countries are located in Africa or Central or South America. Nor are any located in Western or Southern Asia. Only Korea, in fact, is located on the Asian mainland. None of the 12 belongs to the Soviet bloc of countries.

Telecommunications development requires investment and the necessary investment is being made largely in countries with the most competitive and developed national economies. Most of the world's population does not live in those countries and cannot expect to benefit much from the modest surge in international telecommunications investment expected during the coming 2 years. But the real threat to developing countries lies not in the present but the future.

Mexico is one developing country facing difficult decisions. The national economy has been in the doldrums for several years, and was further damaged by the most recent rounds of oil price cuts. The country is already burdened with a massive national debt. And the tragic earthquake which devastated Mexico City last fall imposed an additional financial weight on shoulders already carrying a heavy load.

Telefonos de Mexico (TELMEX) is determined to accelerate the development of the country's telecommunications infrastructure. The heavy damage done by the earthquake to its facilities in central Mexico City seem to have increased the resolve of its decision-makers. TELMEX plans to spend $850.7 million in 1986 and $945.9 million in 1987, dramatic increases from the $505.6 million spent in 1985 and nearly double the $477.3 million spent in 1984. Figure 2 examines the distribution of services and investments in Mexico in more detail.

Where will the money come from? In 1984, Mexico's economy, though battered, was in better condition than it is today and the country did not have to contend with the effects of the earthquake. Oil prices were higher a few years ago, and Mexico depends on its oil earnings to pay its foreign debt and, eventually, to fuel economic growth. The falling price of the dollar does help some countries, but the price of the Mexican peso is falling even faster.

Yet if TELMEX does not pursue a program of accelerated development, Mexico's position in the competitive world economy will be further jeopardized. Mexico's dilemma, though particularly hard, is characteristic of the problem which faces all developing countries.

Countries which lack competitive telecommunications infrastructures find it difficult to compete in the world economy. As developed countries spend more and more on their telecommunications systems, developing countries which do not respond in kind find themselves less and less competitive. In the contemporary world, sophisticated telecommunications infrastructures are not the effect of economic prosperity, they are one of its primary causes. □

The source

THIS article has been based on a report by Telephony/Market Research titled, "World Telecom in 1986-87: Delivering on Past Promises."

The report, which will be approximately 200 pages long, will be available in early March.

For more information, contact Czatdana Inan, Market Research Director, Telephony/Market Research, Telephony Publishing Corp., 55 E. Jackson Blvd., Suite 1100W, Chicago, Ill., U.S. 60604; telephone: (312) 922-2435. □

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U.S. law may boost telecom development in Third World

GREGORY C. STAPLE

LAST December, the Congress of the United States passed a foreign aid bill. The bill attracted little notice. But it eventually could lead the World Bank and its sister organizations to make tens of millions of dollars in new loans for telecommunications facilities in the Third World.

The new law requires the U.S. executive directors of the World Bank and of three other multilateral banks "vigorously" to promote a shift in the banks' lending priorities. In place of large scale, capital intensive projects, which often have had disasterous environmental effects, the law mandates U.S. support for small scale, environmentally beneficial and culturally appropriate projects, including "rural and mobile telecommunications systems."

To date, the kind of village-based communications systems encouraged by the law have won only a fraction of the banks' annual loan budgets. The U.S. legislation consequently provides an important tool for those development experts throughout the world who have long argued that telecommunication investments are one of the most cost effective catalysts for stimulating balanced economic growth.

Loans for telecommunications facilities also are less likely to add to the debt crisis facing developing countries because the costs of telecommunications facilities generally can be recouped directly through the use of appropriate nationwide tariff structures. Much industrial and agricultural development debt, by contrast, cannot be directly tied to proven revenue sources.

The U.S. reform proposal is the result of an unprecedented 3-year campaign by a coalition of environmental organizations. Led by Bruce Rich, a senior staff attorney at the Environmental Defense Fund (EDF) in Washington, the coalition began to focus on the development banks' lending record in the early 1980s as evidence mounted regarding the massive environmental damage caused by bank-financed projects. Because the U.S. is the single largest stockholder in the development banks, the environmentalists reasoned that if their American representatives were required to push for an ecologically sensitive loan agenda, the banks were likely to take heed.

"No other international or bilateral institutions have more impact on development projects in the Third World than the multilateral banks," said Rich.

In recent years the four organizations targeted by the new legislation—the World Bank, the Inter-American, Asian and African Development Banks—have lent more than $20 billion annually. In fiscal 1985, the World Bank alone made $15.3 billion in new loan commitments for 236 projects in more than 80 countries.

To the distress of EDF and its allies in Congress, notably Sen. Robert Kasten (R., Wis.) and Rep. David Obey (D., Wis.), the banks have concentrated their loans in sectors which are likely to cause serious environmental and public health problems. Energy, transportation and cash crop agricultural projects are particularly problematic, according to Rich. For example, a 1500 kilometer access highway and jungle colonization project in northwest Brazil, known as Polonoroeste, was halted by the World Bank last year after deforestation, disease, crop failures and the dislocation of local Indians became too great to ignore.

For U.S. policymakers, the lesson is now clear: Economic development must be linked to sustainable management of natural resources and respect for indigenous peoples. The new law thus requires the U.S. to press the banks "to increase the proportion of their lending programs supporting environmentally beneficial projects and appropriate or light capital technology projects." As examples of desirable projects, the law expressly includes "energy efficient technologies such as. . .rural and mobile telecommunications systems."

The suggestion that telecommunications may form an integral part of a new, environmentally responsible loan agenda raises exciting hopes as well as challenges.

During the last decade, a growing number of communications planners, including respected World Bank economists like Robert Saunders and Bjorn Wellenius have campaigned to make telecommunications a more equal partner in Third World development. There are now a wealth of studies (many surveyed in Saunders, Wellenius and Jeremy Warford's 1983 text "Telecommunications and Development") showing that the economic returns from telecommunications investments, even in rural areas, equal or exceed the return from traditionally favored development projects, such as power generation and road building. Yet telecommunications has been historically treated as a poor relation by the development banks (Table 1).

Furthermore, contemporary technology has also enhanced the promise of rural and mobile telecommunications facilities. Small earth stations, solid state telephone exchanges of 100 or fewer lines, low-cost radio links from earth stations to surrounding communities and alternative solar power sources for areas lacking reliable electrical grids are now available. Drawing on these technologies, the 1983 GLODOM study by the International Telecommunication Union (ITU) in Geneva, estimated that for only $1.3 billion—half the amount the World Bank loans annually for power projects—four high powered satellites could be interconnected to roughly 50,000 small earth stations to supply low-cost telephone service throughout the developing world.

Last year the ITU's Maitland Com-

Continued on page 43

Gregory C. Staple is an Attorney with the firm of Koteen & Naftalin, Washington.

Table 1 Sectoral Distribution of World Bank Group Loans, 1983 to 1985 (in million U.S. $s)

	1983	1984	1985
Agricultural and rural development	$ 3,689	3,473	3,749
Electric power	1,768	2,649	2,250
Transportation	1,924	2,597	2,139
Water supply and waste disposal	811	641	781
Industry	692	591	644
Education	548	694	928
Telecommunications	57	166	122

Source: World Bank Annual Reports

Continued from page 42

mission took up the call. The commission's report noted a pattern of continuing underinvestment in telecommunications throughout the Third World. In many countries, telephone densities are still on the order of 1 or 2 per 1000 people, as compared to 800 or more in industrialized nations. The commission concluded: "no development program of any country should be regarded as balanced, properly integrated or ... effective, without a full and appropriate role for telecommunications."

The telecommunications development needs of Third World countries and the goals of U.S. lending policy have converged.

The hope is that changing U.S. policy toward the development banks will give telecommunications lending new prominence. The challenge will be to make the economic and environmental merits of such loans more widely known.

From an energy conservation standpoint, there is already considerable evidence that the availability of telephone service and mobile radio facilities can sharply reduce transport and fuel costs that have led many countries to borrow heavily in the past.

In developing countries, where truck and bus fleets typically form the backbone of the transportation system, efficient fleet management thus can have large benefits. Similarly, although transport corridors are often viewed as central to the development of remote areas, where the ecological and human costs of such projects are very high, less-intensive construction with greater reliance on telecommunications facilities may be preferable.

Recent World Bank projects in Nepal could point the way. According to the fiscal 1985 report, more than $20 million is being loaned as part of a $65 million program to expand telephone facilities in Katmandu, Nepal's capital, and to provide telephone services to about 90 rural communities for the first time.

At the same time, however, the bank has committed more than $47 million to Nepal for a new all-weather, east-west highway to "integrate" the far western portion of the country. Although the absence of such a highway undoubtedly has affected commerce, a principal effect of past road-building schemes has been accelerating the deforestation and urban migration from which Nepal, like other developing countries, now suffers.

In the longer run, by addressing these issues, telecommunications may be able to make the most significant contribution to the alternative development paradigm propounded by the environmentalists. Of course, modern telephone or telex facilities in and of themselves will not keep people on the land or enable them to increase it wisely. But they will help.

By carefully balancing telecommunications investment to support marketing arrangements, social services delivery systems and other development projects that sustain a country's resources base, communication may make an important contribution. In addition, by expanding access to local telecommunications facilities, more local people can be brought into the planning process.

Implementing this new agenda will not be easy. The bureaucratic inertia of the multilateral banks is considerable. As the environmentalists have learned, even the smallest reforms require sustained lobbying, both within the United States and other major donor nations.

Further research also will be necessary to explore the best way to use rural and mobile telecommunications technologies to support the goals of the new legislation. Technology is not a panacea. Small diameter earth stations, for instance, can be used as easily to support remote mineral exploration as to link rural areas of a country together. The satellite-based communication systems serving northern Canada and Alaska illustrate the point.

At root, the new U.S. law's success in stimulating more telecommunications loans will depend on the response of its intended beneficiaries.

As Douglas Goldschmidt, a New York-based communication expert who has consulted for the U.S. Agency for International Development and the satellite industry, stresses: "It is up to the government of the borrowing country to initiate a request for World Bank group lending in a particular sector, such as telecommunications, and to determine the priority of that request in terms of overall national borrowing [for development projects]. Without the initial government priority, telecommunications will not become part of the loan program."

It is too early to judge the impact of the U.S. initiative on World Bank lending practices. At recent congressional hearings in Washington, however, Reagan administration officials made it clear that they will actively seek to implement the new agenda established by the 1985 law. The administration's nomination of former U.S. Rep. Barber Conable (R-N.Y.), an independent-minded politician knowledgeable about economic affairs, to assume the presidency of the World Bank, also suggests that reform is in the air.

It is now up to the international communications community in the industrialized countries and the developing world to take advantage of these promising developments.

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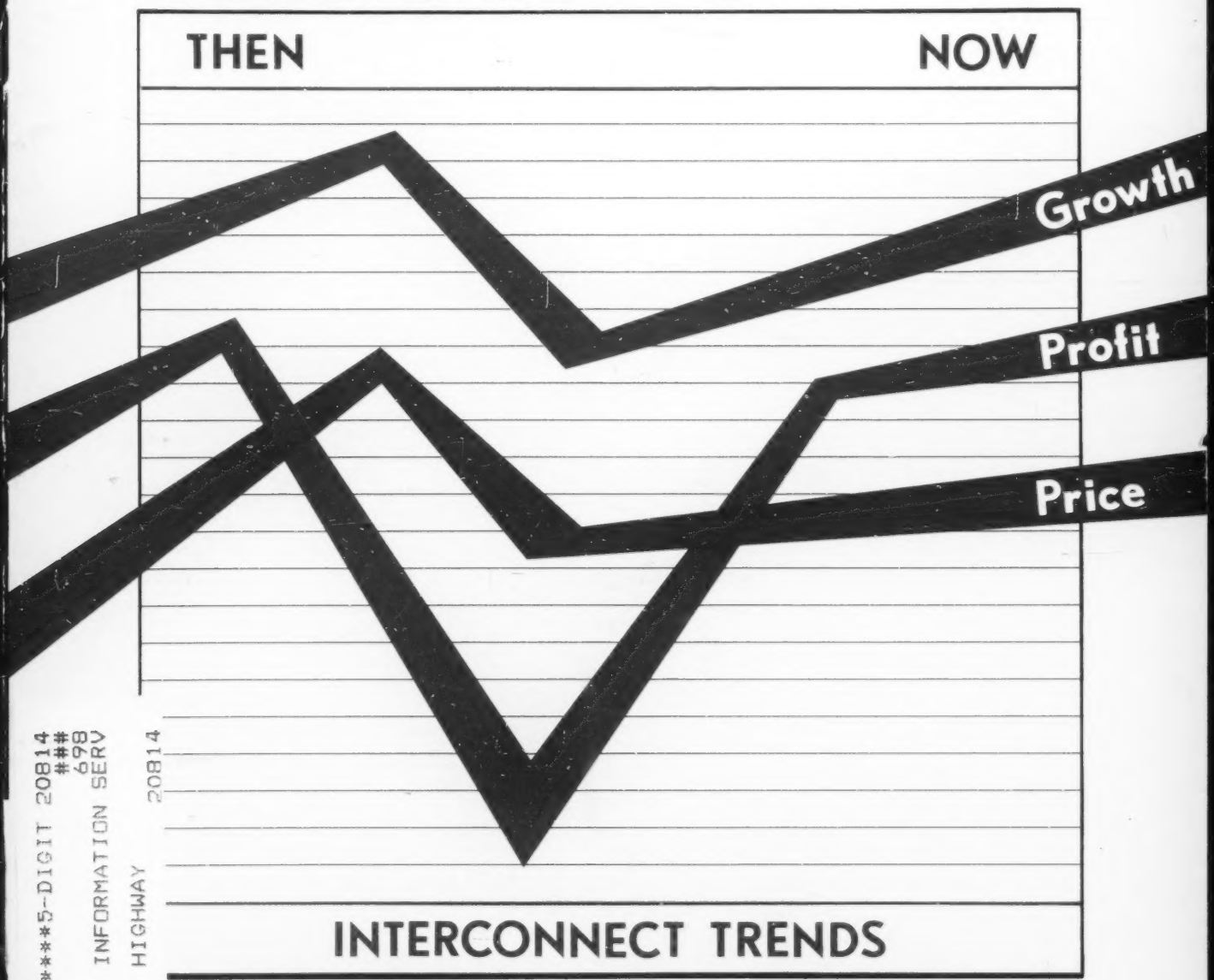

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The Top 25 Interconnects: Trends and Challenges

CZATDANA INAN, MARKET RESEARCH DIRECTOR, AND LARRY LANNON, EXECUTIVE EDITOR

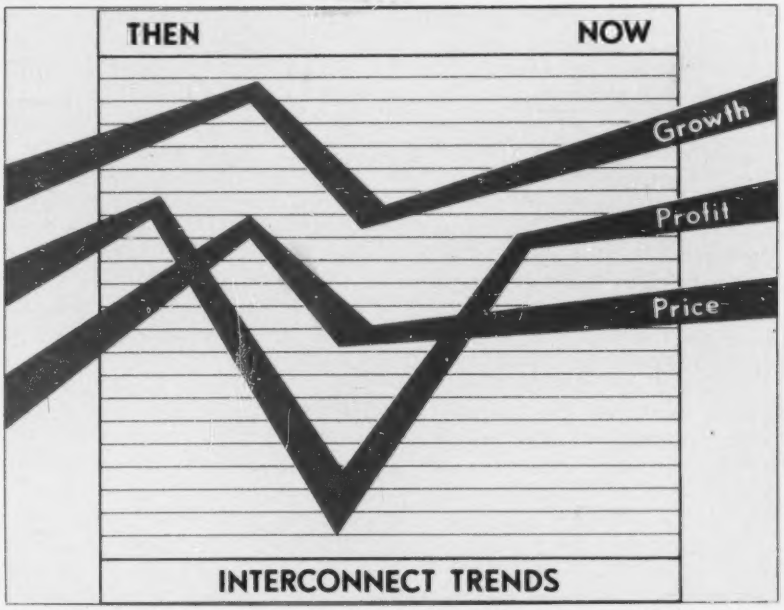
THE MAJOR interconnects will stress return on investment this year and next as they move to consolidate following a wave of mergers and acquisitions. Sales are up, but profits down in the industry. Improvement in the profit picture is expected, though, as the major interconnects capitalize on their increased customer bases, bases they built and paid for in the coin of the realm: by sacrificing profits in '84 and '85. A new day is dawning.

Vicious price competition and rising tides of red ink have scarred the interconnect industry. Mergers and acquisitions have been the preferred antidotes. But the antidotes haven't always worked, and some patients have been lost.

Now, however, the industry is poised on the doorstep of a new—and for some—more profitable phase. Work done by TELEPHONY's Market Research Department indicates that the major changes currently sweeping the industry will continue to make themselves felt and radically affect the industry's future.

Not that the new phase will be less competitive. Competition will take new forms, and new competitors will play even larger roles. But the competition itself will be as fierce as ever. Inefficient or less capable interconnects will find themselves under mortal siege by large competitors free to compete with fewer restrictions than they have had. To top it all off, Centrex is more competitive than ever.

Six major changes will clearly differentiate the new phase from the industry's earlier phases. There will be a new emphasis on selling to existing customers, rather than on further expanding the customer base. Consequently, it will be more important than ever to sell applications rather than substitutes, which will be further incentive for interconnects to bring the latest in information processing technology to the market. Those two factors, in turn, will lead to hot competition for the top end of the market.



Cover art by Sharon Manjack

After some hard years, things are looking brighter for the interconnect industry.

Fourth, instead of cutting prices in ever more frenzied attempts to build or retain market share, interconnects will defend price levels and attempt to bolster margins. Defending price levels will entail increasing productivity and consolidating operations. Finally, the new phase will see the interconnect subsidiaries of regional holding companies mature as dominant players in a more highly structured industry.

These six changes are obviously closely related. For instance, the drive to boost margins by defending price levels is furthered by the interest in selling to existing customers, since customers who are familiar and satisfied with a vendor are much less likely to make decisions based solely on price.

Individually, these six major changes are neither new nor decisive in reshaping the industry. Collectively, they are new and will be decisive. Their impact will exceed the sum of their parts.

One thing about the interconnect industry seems unlikely to change. Hard information—about sales, financing, customers—is hard to come by. Information is seen as a marketing weapon in a business so competitive that small advantages loom large. On the other hand, interconnect decisionmakers frequently express themselves bluntly about market forces and their own intentions. The interconnect industry generally hoards data, but freely talks about how to interpret the market, an approach to information which has its roots in the industry's highly competitive atmosphere. It is important that potential customers know what an interconnect company can do and how it plans to do it, and it is just as important that competitors do not know how well

that interconnect has succeeded in doing what it would like to do.

TELEPHONY's Market Research Department contacted the top 25 interconnects for this story and asked them to supply both hard data and an explanation of how they planned to attack the market. (For a note on methodology, see sidebar.) The top 25 interconnects include seven companies which are affiliated with regional holding companies and five which are affiliated with non-Bell carriers. Three of the top 25 are affiliated with retailers. Ten are not affiliated with any telecommunications carrier, retailer or manufacturer.

Table 1 is an index of the TELEPHONY top 25 interconnects. The RHC-affiliated interconnects are lumped into a single entry because only one will break out earnings. However, TELEPHONY's Market Research Department estimates the seven RHC interconnects will do approximately $800 million in business in 1986. In addition, detailed information on seven of the top 25 interconnects is presented in sidebar form.

The non-affiliated interconnects are Telecom Plus International, Norstan Communications Systems, the Telephone Systems Division of RCA Service Co., Universal Communications Systems, Communications Corp. of America, Honeywell Communications Services Division, Jarvis Corp., Henkels & McCoy/Telecom Systems, Standard Telecommunications Systems and Gray Communications. Businessland, Tandy's Radio Shack and Sears Business Systems Centers are affiliated with retailers. Centel Business Systems, Contel Executone, C-TEC, SNET's Sonecor and Rochester Telephone's Rotelcom are affiliated with non-Bell carriers. The RHC affiliates are U S West Information Systems, Southwestern Bell Telecom, PacTel InfoSystems, Bell Atlanticom Systems, Nynex Business Information Systems, Ameritech Communications and Bell-South's Advanced Systems.

The RHC interconnects volun-

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TABLE 1 INTERCONNECT RESULTS

Index of the top 25 interconnects
(Sales in millions of dollars)

	1983	1984	1985
RHC Affiliates		650.0*	715.0*
Non-Bell			
Centel Business Systems (a)	205.2	219.7	193.1
Contel/Executone	178.0*	195.0*	215.0*
C-TEC Corp. (b)	13.6	14.8	19.5
Sonecor Systems (c)	15.1	58.3	76.9
Rotelcom	15.0*	18.0*	22.0
Retailers			
Businessland	10.1	89.6	267.5
Tandy Corp.	na	na	na
Sears Business Systems	na	na	na
Non-affiliated			
Telecom Plus	106.2	155.2	240.9[d]
RCA Telephone Systems	102.5*	105.0*	110.0*
Universal Communications Systems	52.6	64.9	66.4
Communications Corp. of America	46.1	62.1	50.1
Honeywell Communication Services	56.0*	65.0*	73.0*
Norstan Communications Systems	25.3	31.8	80.0[e]
Henkels & McCoy/Telecom Systems	26.0	34.0	35.0*
Jarvis Corp.	24.5	26.7	31.5
Standard Telecommunications	17.2	19.7	18.1
Gray Communications	10.9	14.8	16.4

* estimated by Telephony

a: sales to customers other than regulated affiliates less sales of non-affiliated supply business sold January 20, 1986.

b: formerly Commonwealth Communications

c: Southern New England Telephone's Telecommunications Group sales. Group posted net loss of $26 million in 1985, $20.9 million in 1984 and $7.5 million in 1983. Increase in 1985 loss primarily attributable to $9 million adjustment in Sonecor Systems' inventory to current market value.

d: acquired Compath

e: acquired Electronic Engineering Co.

na: not available

METHODOLOGY

TELEPHONY's index of the top 25 interconnects is designed to account for general economic conditions, shifts in distribution channels and trends in new targeted markets. It is based on 25 interconnects in the three basic sectors of the market: the telcos' CPE subsidiaries and affiliates, major retailers and interconnects not majority-owned or direct sales arms of manufacturers. Non-affiliated interconnects with $15 million to $25 million in annual sales doing business in key metropolitan or regional areas are included to more clearly reflect temporary economic gliches in areas of the country—for example, the effect of sliding oil prices in Texas—not immediately apparent in the profiles of the larger non-affiliated interconnects with multiregional and national customer bases. The smaller interconnects can and do change from year-to-year.

This year's index includes Businessland, which acquired the AmeriSource stores, included in last year's index. Compath, acquired by TelPlus of Telecom Plus International, was replaced by Gray Communications, which acquired the Pennsylvania locations of Sonecor Systems. The 25 companies in this year's index were asked to respond in terms of their total sales, cost of sales, net income, total assets, total inventory level, orders booked, total employees, locations, and PBX and key system lines installed for the period 1983-85. They were also asked to list the voice communications, data communications, administrative equipment lines and any network services included in their offerings. Twenty-one of the 25 responded in part or with complete information.

The regional holding companies' CPE subsidiaries were cooperative in providing product line information along with total employees and locations. Most balked at installed lines, inventory levels and orders booked.

With the exception of Businessland, the major retailers also balked at providing financial information. □

Gray Communications

	1983	1984	1985	Est 1986
Financials ($000)				
Sales	$10,976	$14,841	$16,413	$22,000
Inventory	$ 2,158	$ 3,806	$ 4,167	$ 4,400
Total Employees	193	217	214	250
Total Locations	5	6	6	7
Installed/Cum				
PBX Lines	16,500	29,500	50,120	90,000
KS Lines	10,500	16,850	24,170	34,000

Standard Telecommunications Systems, Inc.

	1983	1984	1985	Est 1986
Financials ($000)				
Sales	$17,236	$19,715	$18,065	$22,000
Cost of Sales	10,738	12,425	11,075	13,487
Assets	$10,936	$12,476	$11,780	$12,000
Inventory	$ 2,985	$ 3,487	$ 3,506	$ 3,900
Total Employees	260	247	200	230
Total Locations	9	5	5	5
Installed/Cum				
PBX Lines	45,000	50,000	52,000	65,000
KS Lines	5,000	7,000	20,000	23,000

teered little hard information. However, Southwestern Bell Telecom projects a 12% increase in 1986 sales from $100 million in '85 to $112 million. In addition, Ameritech reported 1984 sales of $100 million. Therefore, it seems likely, based on the admittedly meager data on hand, that as a group the RHC interconnects will probably do about $800 million in business this year, a substantial increase from the $650 million to $700 million they did in 1984, figures which would have been somewhat larger had Advanced Systems not gotten a late start.

The RHCs also are increasing staff while holding sales locations constant. For instance, Southwestern Bell Telecom increased staff to 1000 this year from 820 in 1984 but still has the 12 sales locations now it had then. The company also reported that PBX installations increased from 24,700 in 1984 to 30,690 in 1985. Bell Atlanticom reported that its 500 employees are scattered around 13 locations. It has an installed base of 150,000 PBX and key system stations.

U S West Information Systems has a staff of 1878 employees at 53 sales locations; that count includes both the Interline and Business Sales and System (formerly known as FirsTel) groups. Thanks in large part to its acquisition of the IBM Product Centers, Nynex Business Information Systems reported that its work force increased from 1500 to 2500 employees during the past year, and the number of locations soared from 17 to 115.

Among the non-affiliated interconnects, Telecom Plus International reported losses in 1985 attributed to the higher than anticipated costs of consolidating Compath National's operations into its corporate structure. However, the Compath National acquisition did provide Telecom Plus entry into growth markets in the Pacific Northwest and on the West Coast, and increased its installed customer base by 36% to more than 45,000. The company also obtained more than $85 million in new funds when Siemens of West Germany increased its ownership from 20% to 35%. These moves could be a prelude to a long-term strategy for merging telecommunications and information processing markets in conjunction with Telecom Plus Software Systems and American Consolidated Technologies, a wholly owned subsidiary of Telecom Plus which manufactures inside wiring products.

Among the other non-affiliated in-

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C-TEC Corp.
(Formerly Commonwealth Communications Enterprises)

	1983	1984	1985	Est 1986
Financials ($000)				
Sales	$13,583	$14,829	$19,521	$26,414
Cost of Sales	8,881	8,370	10,991	15,357
Net Income (a)	743	1,053	1,344	1,568
Total Employees	82	136	163	210
Total Locations	1	3	2	5
Lines Installed[b]				
PBX Lines	3,500	1,300	3,950	1,500
KS Lines	1,400	2,200	1,200	1,900

a: after other expenses including taxes
b: annual installations

Communications Corp. of America (CCA)

	1983	1984	1985
Financials ($000)			
Sales	$46,087	$62,079	$50,097
Cost of Sales	37,501	52,635	45,967
Net Income (a)	$(1,757)	$(5,050)	$(13,384)
Assets	$41,367	$43,999	$43,580
Inventory	$18,787	$20,877	$22,831
Orders Booked	$36,943	$50,187	$34,874
Total Employees	nr	nr	500
Total Locations	nr	nr	23
Installed/Lines			
PBXs	nr	nr	564,900[b]
Key Systems	nr	nr	210,500[c]

a: Net income after other expenses
b: represents 1,310 PBX systems
c: represents 6,539 KS systems

Interconnect

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terconnects, Norstan, which purchased Electronic Engineering last year, reported sales jumped from $31.8 million in 1984 to $80 million in 1985. CCA, which saw sales drop from $62.1 million in 1984 to $50.1 million last year, estimates 1986 sales at $55 million. Standard Telecommunications anticipates $22 million in sales in '86, up from $18.1 million in '85 and $19.7 million in '84.

RCA Telephone Systems, which will not reveal sales or financial figures, did confirm that our estimates are within 10%. RCA Telephone is one of the non-affiliated interconnects which continues to concentrate on voice systems. Others, notably CCA, are more aggressively moving into data. In fact, CCA sells DEC mini and mainframe computers.

Some interconnects do not confine their efforts to CPE equipment. For example, Telecom Plus International sells US Sprint's WATS service. Standard Telecommunications sells

Universal Communications Systems

	1983	1984	1985
Financials ($000)			
Sales	$52,600	$64,900	$66,400
Cost of Sales	44,800	56,900	56,600
Assets	$31,900	$34,000	$34,300
Inventory	$15,100	$10,900	$10,900
Total Employees	nr	537	595
Total Locations	nr	nr	200
KS Lines Installed	nr	nr	573,969

Telecom Plus International

	1983	1984	1985
Financials ($000)			
Sales	$106,196	$155,223	$240,932
Costs*	132,537	163,534	274,359
Income	$(26,341)	$ (8,311)	$(33,427)
Assets	$169,324	$235,456	$238,922
Inventory	$ 19,150	$ 60,770	$114,255
Total Employees	1,600	1,700	3,140
Total Locations	60	95	99
Installed/Cum			
PBX Lines	na	360,000	1,400,000
KS Lines	na	440,000	650,000

* includes depreciation and G&A expenses. Cost of sales was $94 million, $117 million and $188 million, 1983-85, respectively.

Interconnect

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New York Tel's Centrex service and US Telephone's long-distance services.

Among the interconnects affiliated with non-Bell carriers, Centel Business Systems reported a drop in sales from $219.7 million in 1984 to $193.1 million in 1985. Centel Executone's sales rose from $195 million in 1984 to $215 million in 1985, according to our estimates. Over the same period, C-TEC reported an increase from sales of $14.8 million in 1984 to $19.5 million in 1985, Sonecor Systems' sales went from $58.3 million in 1984 to $76.9 million in 1985, and Rotelcom's sales, according to our estimates, went from $18 million in '84 to $22 million in '85.

Among the interconnects affiliated with retailers, an interesting and secretive group, Businessland was the big surprise. It bought the AmeriSource stores from United Telecom and transformed them into Businessland Centers. Businessland Centers, unlike AmeriSource stores, do not sell traditional telephone-related products. They sell IBM micros, private label modems, and the Apple, Compaq and Hayes line of computers. The company is well-positioned to meet the needs of small data communications users. The acquisition of AmeriSource stores boosted Businessland's employees from 1500 to 2000, and increased its locations from 65 to 140, a ratio of seven employees per store.

Sears Business System Centers have five to 10 employees in each of their 103 locations. They sell AT&T and Trillium key systems and AT&T and Hayes modems. Radio Shack is concentrating on the small business user, too, and is offering cellular equipment.

The competition from the re-

Centel Business Systems

	1983	1984	1985
Financials ($000)			
Sales			
Regulated Affiliates	36,957	38,068	40,489
Other Customers (a)	267,186	275,619	235,080
Expenses	300,903	302,928	281,066
Income	3,240	10,759	(5,497)
Assets	142,132	171,470	133,841
Order Backlog	61,268	96,768	71,411
Total Employees	2,096	2,111	1,941
Total Locations	52	52	56
PBX/KS Lines			
Cummulative	578,000	700,085	825,171

a: adjusted in Table 1 to reflect sale of non-affiliated supply business assets and sales attributable of $62.0 million, $55.9 million and $41.9 million in 1983-85, respectively.

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tail giants is making life rough for the smaller interconnects which would like to serve the smaller users.

Like the carriers, though, the interconnects are growing ever more interested in the large business user. Those large users are themselves changing, specifically by consolidating their technology groups. Typically, large users with complex telecommunications systems are beginning to consolidate diverse and formerly discrete responsibilities—voice communications, data communications, systems and planning, and DP/MIS—under an emerging information services officer who usually is a vice president. The reason is simple: Communications today is so fundamental to corporate operations that it is no longer acceptable to have separate and separately managed communications systems. The old barriers are coming down quickly.

Interconnects must take these changes into account when they lay their plans. Large users, for instance, now have centralized planning operations. Even when different corporate locations do their own purchasing, it is increasingly common for the central planning staff to set standards, and review and approve all purchasing decisions. Large users now tend to have primary suppliers, send out formal requests for information and requests for proposal, and do their own system evaluations. In other words, large users now operate much like carriers. Interconnects must offer planning expertise which takes into account the same factors the user's planning group considers.

The key will be to bring complex applications to the user's planning group which fit corporate needs as precisely as possible. The interconnects which penetrate the large user market must sell applications.

Yet many interconnects are failing to position themselves as cost-saving technology planners who can work with users to plan and provide the most practical systems for a given corporate environment, opting instead to continue selling service. Telcos made an analogous mistake in the late '60s and early '70s, creating an opportunity that interconnects hurried to seize.

It may be that the interconnects which do not do application selling choose to believe that conditions in the business market have not changed enough to justify a change in approach. In such a grimly competitive business, management's ability to precisely measure changes in degree and base changes in kind on those measurements is crucial. The market is sure to put that management ability to a rigorous test.

It may also be that some of the top 25 interconnects, excluding the retailers, of course, simply are hesitant to pursue large users. Perhaps they are uncomfortable operating at that level or believe the smaller business customer will provide sufficient demand to keep profits up. Whatever their motivation, look for large interconnects which shun the competition for large users to be involved in additional mergers. □

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